

EXHIBIT 28

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

VIDEOCONFERENCE DEPOSITION OF CHRISTOS KYRIAKAKIS

Friday, June 11, 2021

Volume I

22 Reported by:
 KATHLEEN E. BARNEY
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6	SONOS, INC.,)	6	BY MR. PAK
7	Plaintiff,)	7	
8	vs.)Civil Action No.	8	
9)6:20-cv-00881-ADA	9	
10)	10	EXHIBITS
11	GOOGLE, LLC,)	11	NUMBER
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14)	14	Exhibit 1 Audyssey manual
15	11	15	21
16	Videoconference deposition of CHRISTOS	16	
17	KYRIAKAKIS, Volume I, taken on behalf of Plaintiff,	17	
18	beginning at 9:02 a.m. and ending at 3:10 p.m. on	18	
19	Friday, June 11, 2021, before KATHLEEN E. BARNEY,	19	
20	Certified Shorthand Reporter No. 5698.	20	
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1 Exhibit 13 Dua Patent Application 2 Publication 3 4 Exhibit 14 '033 patent 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	159 196	1 from Lee Sullivan Shea & Smith. 2 MR. KAPLAN: This is Marc Kaplan from Quinn 3 Emanuel Urquhart & Sullivan for Google and the 4 witness. 5 MR. LEE: Good morning. This is George Lee 09:03:52 6 for plaintiff Sonos. I'm also with the firm of Lee 7 Sullivan Shea & Smith in Chicago. 8 THE VIDEOGRAPHER: Thank you. Will the court 9 reporter please swear in the witness. 10 11 CHRISTOS KYRIAKAKIS, 12 having been administered an oath, was examined and 13 testified as follows: 14 15 EXAMINATION 16 BY MR. PAK: 17 Q Dr. Kyriakakis, could you please state and 18 spell your name for the record. 19 A Sure. First name is -- legal first name is 20 Christos, but I go by Chris, last name is 09:04:34 21 K-Y-R-I-A-K-A-K-I-S. 22 Q Is it okay if I call you Dr. K throughout 23 this deposition? 24 A Yes, please do. 25 Q Have you been deposed before? 09:04:48
1 Friday, June 11, 2021 2 9:02 a.m. 3 4 THE VIDEOGRAPHER: Good morning. We are on 5 the record at 9:02 a.m. on June 11, 2021. 09:02:30 6 All participants are appearing remotely. 7 Audio and video recording will continue to take 8 place unless all parties agree to go off the record. 9 This is Media Unit 1 of the recorded 10 deposition of Christos Kyriakakis taken by counsel 09:02:49 11 for the plaintiff in the matter of Sonos, Inc., 12 versus Google, LLC, filed in the U.S. District 13 Court, Western District of Texas, Waco Division, 14 case number 6:20-CV-00881-ADA. 15 My name is Kimberlee Decker from Veritext 09:03:12 16 Legal Solutions. I'm the videographer. The court 17 reporter is Kathy Barney. I'm not related to any 18 party in this action, nor am I financially 19 interested in the outcome. 20 Counsel and all present will now state their 09:03:26 21 appearances and affiliations for the record. If 22 there are any objections to proceeding, please state 23 them at the time of your appearance, beginning with 24 the noticing attorney. 25 MR. PAK: This is Jae Pak, counsel for Sonos,	Page 6	Page 8 1 A I have. 2 Q How many times have you been deposed? Just a 3 ballpark is fine. 4 A Two other times. 5 Q How many times have you been deposed as an 09:04:57 6 expert witness? Were you an expert witness in both 7 of those cases? 8 A Yes, I was. 9 Q And these are patent cases, correct? 10 A Correct. 09:05:16 11 Q When was the last time you were deposed? 12 A It was -- I think it was 2018. I don't have 13 the exact date, but I think it was 2018. 14 Q Sure. Do you remember what case that was? 15 A It was -- so it was two in that same year. 09:05:34 16 So one of them was -- I was working on behalf of 17 Apple, which was an ITC case. Actually, initially 18 the case involved Apple and Samsung as 19 co-defendants. So that was one case. And the other 20 case was for Apple, a separate case. 09:06:05 21 Q Okay. And so we're on the same page, I want 22 to run through some general guidelines. So just 23 bear with me here. 24 I'll ask you questions and you must give 25 truthful answers. Your counsel may object to 09:06:20 Page 7

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<p>1 questions, but unless your counsel instructs you not 2 to answer, you still must answer despite the 3 objection.</p> <p>4 Do you understand?</p> <p>5 A I do. 09:06:30</p> <p>6 Q And if you don't understand a question or 7 need clarification, please ask. Otherwise I'll 8 assume that you understand the question.</p> <p>9 We'll plan to take a break every hour or so.</p> <p>10 If you need a break outside of that schedule, just 09:06:38 11 let me know and I'll accommodate the request. The 12 only thing I ask is, you know, to finish any pending 13 question before we go on break.</p> <p>14 And the court reporter will be transcribing 15 our discussion today, so I need you to give verbal 09:06:50 16 answers as opposed to head nods or the like.</p> <p>17 Understood?</p> <p>18 A Yes.</p> <p>19 Q Okay. I'll slow down here now.</p> <p>20 When did you begin working on this case 09:07:02 21 between Sonos and Google?</p> <p>22 A Oh, I don't know the exact date. It was a 23 few months ago.</p> <p>24 Q Okay. So it was sometime this year?</p> <p>25 A Yes. 09:07:16</p>	<p>1 A Probably two other times. It was different 2 attorneys. Different matters.</p> <p>3 Q What was the nature of your engagement with 4 Quinn Emanuel?</p> <p>5 MR. KAPLAN: Object to form. 09:08:33</p> <p>6 THE WITNESS: It was similar. They were 7 patent cases and I was an expert witness for their 8 client.</p> <p>9 BY MR. PAK:</p> <p>10 Q Do you recall what cases? 09:08:43</p> <p>11 A I believe one was Blitzsafe versus Daimler 12 Benz, Mercedes. And the other one escapes me 13 because I remember the cases, but not necessarily 14 all the affiliations.</p> <p>15 THE VIDEOGRAPHER: You're speaking a little 09:09:26 16 low.</p> <p>17 THE WITNESS: Interesting. Okay. Is that 18 better?</p> <p>19 BY MR. PAK:</p> <p>20 Q Have you provided expert opinions on behalf 09:09:44 21 of Google before?</p> <p>22 A I have not.</p> <p>23 Q Have you offered opinions with respect to any 24 Google products?</p> <p>25 A No. 09:09:55</p>
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<p>1 A No.</p> <p>2 Q So how did you set up the Google Home 3 product?</p> <p>4 A That's a good question. It's been a while.</p> <p>5 Okay. I guess I used it to set it up. I 09:11:40 6 thought you were asking if I used it to interact 7 with it.</p> <p>8 Q Okay. Have you used any Google Pixel device 9 before?</p> <p>10 A No. 09:11:53</p> <p>11 Q Have you used any Sonos products?</p> <p>12 A Yes.</p> <p>13 Q What Sonos products have you used before?</p> <p>14 A Sonos Play:1. And Sonos Subwoofer.</p> <p>15 Q Have you used any other Sonos products 09:12:17 16 before?</p> <p>17 A No.</p> <p>18 Q Do you own a Sonos Play:1 or Sonos Sub?</p> <p>19 A Yes, I do.</p> <p>20 Q When did you first purchase the Play:1 and 09:12:33 21 the Sonos Sub?</p> <p>22 A Two years ago approximately.</p> <p>23 Q Why did you purchase the Play:1 and Sonos 24 Sub?</p> <p>25 A As part of my work and research, I have, I 09:12:59</p>	<p>1 I mean, that's kind of what I do on a regular 2 basis just to understand what is going on and who is 3 doing what acoustically in rooms.</p> <p>4 BY MR. PAK:</p> <p>5 Q So have you evaluated these products for 09:15:04 6 other reasons? Other than acoustic performance, 7 have you evaluated these products for some other 8 reason?</p> <p>9 A No.</p> <p>10 Q And just for curiosity, I guess, which 09:15:15 11 product has the best acoustic performance, in your 12 opinion?</p> <p>13 A I'm going to get in big trouble. I'm not 14 going to answer that. A lot of them it's an 15 objective measurement, but a lot of it is very 09:15:35 16 subjective. So I'm probably going to stay away from 17 that one.</p> <p>18 Q That's fair.</p> <p>19 I want to talk about your professional 20 experience. Do you have any computer programming 09:15:46 21 experience?</p> <p>22 A Yes.</p> <p>23 Q Do you remember the last time you coded or 24 programmed something?</p> <p>25 A Two days ago. 09:15:59</p>
<p>Page 14</p> <p>1 would say, an unusually large collection of speaker 2 products and I've purchased them to evaluate their 3 acoustic performance, compare them to others, and so 4 on.</p> <p>5 Q Do you own more than one Play:1 and more than 09:13:16 6 one Sonos Sub?</p> <p>7 A I have three Play:1s and one Sonos Sub.</p> <p>8 Q Have you ever stereo-paired two Play:1s 9 together?</p> <p>10 A Yes. Yes, I have. 09:13:47</p> <p>11 Q And have you compared that to other -- when 12 you say others, you're talking about other audio 13 products?</p> <p>14 A I guess what do you mean by "compared"?</p> <p>15 Q Yeah. So you said you evaluated the acoustic 09:14:09 16 performance of the Sonos Play:1 products with 17 others, right?</p> <p>18 A Yes.</p> <p>19 Q And who are these others that you're 20 referring to here? 09:14:23</p> <p>21 MR. KAPLAN: Object to form.</p> <p>22 THE WITNESS: There's a number of them. Some 23 are home speakers. PSB. Bose. Amazon products. 24 Paradigm is a high-end company that makes wireless 25 speakers. A number of others. 09:14:51</p>	<p>Page 16</p> <p>1 Q Got it.</p> <p>2 Have you taught any computer science courses 3 before?</p> <p>4 A No.</p> <p>5 Q Have you taught any network courses before? 09:16:09</p> <p>6 A Network specific, no.</p> <p>7 I should mention I have computer science 8 students in my courses, but they're not specific 9 under the computer science department.</p> <p>10 Q Got it. But you haven't taught any computer 09:16:24 11 science courses. Did you say you haven't taught any 12 network courses; is that correct?</p> <p>13 A That's correct.</p> <p>14 Q Do you have any networking experience?</p> <p>15 A Yes. Quite a bit, especially with streaming 09:16:41 16 media. My research group was one of the first to 17 implement multichannel audio streaming across the 18 country over Internet2, and for that we had a large 19 group that was working on various aspects of 20 networking, including peer to peer and other aspects 09:17:05 21 of it. So, yeah, quite a bit of experience.</p> <p>22 Q What is Internet2?</p> <p>23 A Internet2 is what the internet was when it 24 first started, which is a network that was closed 25 off to the public and only open to academic and 09:17:24</p> <p>Page 17</p>

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<p>1 research institutions. It's a much higher bandwidth 2 network that is basically used for experimentation 3 for next-generation applications on the internet. 4 Q So do you have any experience in designing or 5 implementing a network? 09:17:48 6 A My experience is in coding, testing 7 performance of networks, not necessarily designing 8 networks from scratch. Software that goes on 9 networks, though, yes. 10 Q But you never designed or architected a 09:18:11 11 network, right? Is that right? 12 MR. KAPLAN: Object to form. 13 THE WITNESS: Well, I guess I'm -- 14 architected -- I was part of the team. I led the 15 team that architected a multichannel audio streaming 09:18:34 16 solution, Lossless, over a network. And so I didn't 17 build the network from scratch. It was an existing 18 network. We just built the software to run all of 19 that. 20 BY MR. PAK: 09:19:01 21 Q Got it. 22 And you're the founder and CTO of a company 23 called Audyssey Laboratories; is that correct? 24 A That's right. 25 Q And I see the background. Is that an 09:19:07</p>	<p>1 themselves inside the stores like the Apple Store 2 and Best Buy. 3 Q Do you know any Audyssey -- do you know the 4 product names of any of the Audyssey products? 5 A The loudspeakers? 09:21:02 6 Q Yes. Any Audyssey product, really. 7 A So the main Audyssey product was called 8 MultEQ, M-U-L-T-E-Q. That was the name of the 9 umbrella of technologies that had to do with 10 acquiring in-room information, acoustical 09:21:21 11 information, and correcting it. And the logo is 12 still found on many receivers like Marantz and 13 Denon, D-E-N-O-N. 14 The speaker products had -- were named of 15 after interesting, hip neighborhoods. That was the 09:21:51 16 marketing plan. So Lower East Side, Market -- South 17 of Market. Yeah. 18 Q Are you familiar with the Audyssey Sub 19 Equalizer product? 20 A I am, yes. 09:22:19 21 Q What is a sub equalizer? 22 A A sub equalizer -- so in the home theater 23 market, it is popular to have separate components 24 for audio systems. So people will buy their 25 favorite loudspeakers, they will buy their favorite 09:22:39</p>
<p>Page 18</p> <p>1 Audyssey Laboratories product behind you? 2 A The loud speaker, no. 3 Q No? 4 A No, it's not. I have one, but it's not in 5 this room. 09:19:21 6 Q What products did you help design at 7 Audyssey? 8 A So Audyssey was a spinout from my research 9 lab at USC with a couple of graduate students. We 10 started in the audio technology licensing business, 09:19:36 11 and so the product there was technologies for 12 automatic measuring of acoustical problems in rooms 13 and solutions for fixing them. And perhaps you've 14 seen the little microphone that comes with home 15 theater equipment. You put it in your living room 09:20:01 16 or your car or IMAX theaters, for example. There 17 are many places that have that. 18 So it started as a software solution that was 19 being licensed. In the course of that company, we 20 also designed some loudspeaker products to showcase 09:20:23 21 the technologies so that we could be fully in 22 control of them. 23 And these were wireless speakers. Three were 24 wireless and one was wired. And so those were -- 25 those were the physical products that found 09:20:48</p>	<p>Page 20</p> <p>1 audio receiver amplifier. 2 And for people that already had invested 3 money in a product that didn't have Audyssey room 4 correction in it, we actually made two products. 5 One was called the Audyssey Equalizer, which allowed 09:22:51 6 you to insert it in the path, in the audio path, and 7 take advantage of the Audyssey technologies. 8 And the sub equalizer was basically the same 9 thing except it was only focused on room correction 10 of the subwoofer frequency range, the low 09:23:15 11 frequencies. 12 Q Got it. 13 And I want to introduce an exhibit here. 14 It's the Audyssey manual. And I just uploaded it in 15 the exhibits folder and marked it as Exhibit 1. 09:23:28 16 (Exhibit 1 was marked for identification 17 electronically and is attached hereto.) 18 BY MR. PAK: 19 Q Do you see that? 20 A Not yet. I'm refreshing the screen here. 09:23:34 21 I'm looking at another monitor, so -- 22 Q Sure. I am too. 23 THE VIDEOGRAPHER: You have to refresh the 24 browser each time. 25 MR. KAPLAN: Chris, sometimes you can just 09:24:02</p>

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<p>1 hit the Marked Exhibits folder again and that will 2 do it.</p> <p>3 THE WITNESS: Oh, there it is. Okay. I got 4 it. I'm opening it now.</p> <p>5 BY MR. PAK: 09:24:17</p> <p>6 Q Do you recognize this document?</p> <p>7 A Sorry, it hasn't opened yet.</p> <p>8 Q Sure. Let me know.</p> <p>9 A Okay. Yes, it's open now.</p> <p>10 Yes, I recognize it. 09:24:26</p> <p>11 QOkay. And this is the Audyssey MultEQ Pro 12 User Guide, correct?</p> <p>13 A Correct, MultEQ Pro. It was software that we 14 provided to home theater installers. And this was 15 additional functionality than what a consumer could 09:24:45 16 do with the built-in software. And we marketed it 17 as MultEQ Pro.</p> <p>18 Q I want to turn to PDF, page 14. And there's 19 a connection diagram for the Audyssey Sub Equalizer.</p> <p>20 Do you see that? 09:25:02</p> <p>21 A It's coming. Page 14?</p> <p>22 Q PDF page 14.</p> <p>23 A Oh, PDF page 14.</p> <p>24 Q But it's page 10 of the manual.</p> <p>25 A Okay. 09:25:26</p>	<p>1 data after processing it.</p> <p>2 Q Well, let me ask you this. The Sub Equalizer 3 was not designed to communicate over Wi-Fi, 4 Bluetooth, or Ethernet. How did it communicate over 5 a data network? 09:27:01</p> <p>6 MR. KAPLAN: Object to form.</p> <p>7 THE WITNESS: Well, those are not the only 8 types of networks. Anything that carries data is a 9 data network. So this is an audio data network.</p> <p>10 BY MR. PAK: 09:27:11</p> <p>11 Q You're saying these speakers -- how are these 12 speakers connected to the Sub Equalizer?</p> <p>13 A Through audio cables.</p> <p>14 Q What kind of -- sorry, I didn't mean to cut 15 you off. 09:27:27</p> <p>16 A No, no. It's fine.</p> <p>17 Q What audio cables do you use to connect, you 18 know, one of these speakers to a Sub Equalizer?</p> <p>19 A They're called line level cables or RCA 20 because of the type of connector, which is named as 09:27:46 21 an RCA connector.</p> <p>22 Q So if you have a speaker connected to, you 23 know, another device, you know, another device here 24 being a Sub Equalizer via RCA cables, are they 25 communicating over a data network? 09:28:06</p>
<p style="text-align: right;">Page 22</p> <p>1 Q Okay. So you see the connection diagram for 2 the Audyssey --</p> <p>3 A Yes.</p> <p>4 Q Does that look like an accurate 5 representation of the Sub Equalizer? 09:25:33</p> <p>6 MR. KAPLAN: Object to form.</p> <p>7 THE WITNESS: It's an accurate representation 8 of how we recommended the connection, yes.</p> <p>9 BY MR. PAK:</p> <p>10 Q Was the Sub Equalizer designed to communicate 09:25:48 11 over Wi-Fi?</p> <p>12 A No.</p> <p>13 Q Was the Sub Equalizer designed to communicate 14 over Bluetooth?</p> <p>15 A No. 09:25:58</p> <p>16 Q Was the Sub Equalizer designed to communicate 17 over Ethernet?</p> <p>18 A No.</p> <p>19 Q Was the Sub Equalizer designed to communicate 20 over a data network? 09:26:09</p> <p>21 A Well, it was designed to accept, process and 22 produce or transmit audio data.</p> <p>23 So in the context of data -- audio being 24 data, which it is, I would say yes, it's connected 25 to two devices as shown here and it's passing audio 09:26:30</p>	<p style="text-align: right;">Page 24</p> <p>1 A In the most general definition of a data 2 network, audio certainly falls into that. And I 3 would consider this a wired data network. To put it 4 in the context of the discussion we're having today, 5 yes. 09:28:27</p> <p>6 Q Okay. So, I mean, any device that can carry 7 data to another device is a data network; is that 8 correct?</p> <p>9 MR. KAPLAN: Object to form.</p> <p>10 THE WITNESS: Any infrastructure that can 09:28:37 11 connect devices and carry data, yes.</p> <p>12 BY MR. PAK:</p> <p>13 Q In general, do you have an understanding of 14 what a term of art is?</p> <p>15 A Yes. 09:28:53</p> <p>16 MR. KAPLAN: Object to form.</p> <p>17 BY MR. PAK:</p> <p>18 Q What is your understanding?</p> <p>19 A A term of art in my understanding is -- maybe 20 not the exact legal definition -- it's what a person 09:29:05 21 of skill would understand that to mean in the art, 22 in the field.</p> <p>23 Q Is the term "network" a term of art?</p> <p>24 MR. KAPLAN: Object to form.</p> <p>25 THE WITNESS: Yes. 09:29:25</p>

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<p>1 BY MR. PAK:</p> <p>2 Q Before you were engaged as an expert for this 3 matter, did you have an understanding of what 4 network means?</p> <p>5 A Yes. 09:29:34</p> <p>6 Q What was that understanding?</p> <p>7 A Basically what I said a minute ago. A 8 network is an infrastructure of devices and 9 interconnects that allows the flow of data between 10 them. Or enables the flow of data between them. 09:29:54</p> <p>11 Q Okay. So your definition of a network is the 12 same as a data network; is that correct?</p> <p>13 MR. KAPLAN: Object to form.</p> <p>14 THE WITNESS: I think -- a network carries 15 data, so yes. 09:30:19</p> <p>16 BY MR. PAK:</p> <p>17 Q Is "data" a term of art?</p> <p>18 A Yes, it is.</p> <p>19 Q Before Google engaged you as an expert in 20 this matter, did you have an understanding of what 09:30:41 21 data means?</p> <p>22 A Yes, absolutely.</p> <p>23 Q What was that understanding?</p> <p>24 A Data is in its -- in the highest level 25 definition, data is information. 09:30:53</p>	<p>1 laptops on a data network, correct?</p> <p>2 A Correct.</p> <p>3 Q Are there any other types of devices other 4 than a laptop that can be on a data network?</p> <p>5 A Anything that allows the passage of data 09:32:45 6 through it that is connected to other devices can be 7 on a data network.</p> <p>8 So in a studio environment, microphones and 9 loudspeakers are on a data network, and sometimes 10 over very long distances. The control room is in 09:33:06 11 another place. Obviously computers are on a data 12 network. Cell phones are on a data network. Yes. 13 And many other types of devices.</p> <p>14 Q Sure. And a data network can be wired or 15 wireless, correct? 09:33:26</p> <p>16 A Correct.</p> <p>17 Q What are the types of cables or interfaces to 18 transfer data over a wired data network?</p> <p>19 MR. KAPLAN: Object to form.</p> <p>20 THE WITNESS: Over wired? 09:33:39</p> <p>21 BY MR. PAK:</p> <p>22 Q Yes. I -- well, I assume in a wireless data 23 network you wouldn't need cables, right?</p> <p>24 A Right. Correct.</p> <p>25 In a wired one, I mean, I guess anything that 09:33:51 Page 26 Page 28</p>
<p>1 Q Can data be analog or digital?</p> <p>2 A Yes, absolutely.</p> <p>3 Q Is "data network" a term of art?</p> <p>4 A I would say yes.</p> <p>5 Q Is there a difference between a network and a 09:31:18 6 data network?</p> <p>7 MR. KAPLAN: Object to form.</p> <p>8 THE WITNESS: In the context of what we're 9 speaking of, I would say no. There is a network of 10 people that I have on LinkedIn, but that's a 09:31:35</p> <p>11 different kind of network. But in this context, I 12 would say no.</p> <p>13 BY MR. PAK:</p> <p>14 Q Would you say that a network and a data 15 network are both mediums that carry data? 09:31:54</p> <p>16 MR. KAPLAN: Object to form.</p> <p>17 THE WITNESS: In this context, yes.</p> <p>18 BY MR. PAK:</p> <p>19 Q Okay. What are the types of devices that can 20 be on a data network? 09:32:15</p> <p>21 MR. KAPLAN: Object to form.</p> <p>22 THE WITNESS: The types? What do you mean by 23 "types"?</p> <p>24 BY MR. PAK:</p> <p>25 Q Well, for example, you can have a laptop or 09:32:29</p>	<p>1 can establish electrical connection. So it would 2 be -- it could be copper, it could be optical, it 3 could be Ethernet. There's probably others that I'm 4 forgetting, but --</p> <p>5 Q You mentioned earlier RCA cables, you can use 09:34:20 6 an RCA cable to --</p> <p>7 A Yeah. Those fall into copper for me, but 8 yes.</p> <p>9 Q Got it. What about speaker wires, does that 10 fall under copper? 09:34:33</p> <p>11 A Also under copper.</p> <p>12 Q Does a data network require devices to 13 transfer data in a certain format to communicate 14 with another device that is on the network?</p> <p>15 A There has to be -- the devices have to 09:34:47 16 understand the data coming in. So if that is what 17 you mean by format, then yes. If not, there are 18 translator devices that can convert it.</p> <p>19 Q Okay. So when a device transfers data to 20 another device on a data network, there's got to be 09:35:14 21 some kind of protocol, right?</p> <p>22 A Yes.</p> <p>23 MR. KAPLAN: Object to form.</p> <p>24 BY MR. PAK:</p> <p>25 Q What are the protocols that are required for 09:35:25 Page 27 Page 29</p>

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<p>1 a data network?</p> <p>2 A There's a pretty large number of them. A 3 common protocol is to -- is based on the principal 4 of modulation. Again, I'm speaking in the context 5 of our discussion today and the matters here. 09:35:45</p> <p>6 So in a modulation concept, the modulation 7 type protocol is understood to take in data, put it 8 in a certain form so that the receiving device can 9 understand it. Since we're speaking of audio, pulse 10 code modulation is a common one. 09:36:14</p> <p>11 There are optical protocols called SPDIF, 12 Sony Phillips Digital Interchange Format. There 13 are, of course, computer-to-computer protocols such 14 as Ethernet. And several others.</p> <p>15 Q Okay. Specifically if a device wants to 09:36:49 16 communicate with another device on an internet-based 17 network, what protocols are required for that 18 communication?</p> <p>19 MR. KAPLAN: Object to form.</p> <p>20 THE WITNESS: Can you define internet-based 09:37:10 21 network for me, please?</p> <p>22 BY MR. PAK:</p> <p>23 Q Yeah. So communicate over Wi-Fi or Ethernet, 24 for example.</p> <p>25 MR. KAPLAN: Object to form. 09:37:20</p>	<p>1 than 802.11?</p> <p>2 A Well, there are other Wi-Fi methods that are 3 proprietary to individual companies that may -- that 4 don't have to comply with 802.11 between their own 5 devices. I don't know how they work because they're 09:39:45 6 proprietary, but they do exist.</p> <p>7 Q And these protocols you mentioned, like 8 802.11, for example, or TCP, they require data to be 9 sent in a certain format; is that correct?</p> <p>10 MR. KAPLAN: Object to form. 09:40:02</p> <p>11 THE WITNESS: Those protocols, the standards 12 require, yes, data to be in a certain type. Just 13 like all the other protocols.</p> <p>14 BY MR. PAK:</p> <p>15 Q Do the Wi-Fi and Ethernet standards require 09:40:17 16 data to be sent in data packets?</p> <p>17 A The 802.11 Wi-Fi does. The Ethernet, as I 18 said, you can -- Ethernet is basically the cable. 19 Different protocols can run on it. TCP/IP is data 20 packets, yes. Or it's based on data packets. 09:40:37</p> <p>21 Q Are there any Wi-Fi Ethernet standards that 22 don't require data to be sent in the form of data 23 packets?</p> <p>24 A As I said, I don't know the Wi-Fi inner 25 workings of the proprietary ones, so I'm not sure I 09:40:58</p>
<p>1 THE WITNESS: Oh, I'm sorry. Did you say 2 Ethernet or internet?</p> <p>3 BY MR. PAK:</p> <p>4 Q Wi-Fi or Ethernet.</p> <p>5 A Ethernet. I see. 09:37:29</p> <p>6 Q Yeah.</p> <p>7 A So the format for those is -- I mean, there's 8 a Wi-Fi standard under the 802.11 IEEE, Institute of 9 Electrical and Electronics Engineers, and that 10 standard has been established for -- the devices 09:37:52</p> <p>11 that want to talk to each other on Wi-Fi have to 12 implement that standard on the transmitter and the 13 receiver so that they can communicate.</p> <p>14 There are also standards for Ethernet. A 15 common one is TCP, Transfer Control Protocol. There 09:38:10</p> <p>16 are others.</p> <p>17 Q Can you name some of the other protocols?</p> <p>18 MR. KAPLAN: Object to form.</p> <p>19 THE WITNESS: There are Asynchronous Transfer 20 Mode, ATM. Token Ring kind of networks. And a 09:38:43</p> <p>21 variation of that, which is a Star network.</p> <p>22 That's what comes to mind now. I'm sure I 23 can think of more later.</p> <p>24 BY MR. PAK:</p> <p>25 Q Are there any other Wi-Fi standards other 09:39:18</p>	<p>1 can answer that. Or the wired ones.</p> <p>2 There are multi-room systems that have been 3 around in the home installer market for a long time 4 that use Ethernet. But it's not necessarily a 5 standard Ethernet, based on a standard. So I 09:41:16 6 couldn't say for sure what they use.</p> <p>7 Q Okay. And I want to introduce another 8 exhibit here. Just give me one minute.</p> <p>9 A Sure.</p> <p>10 Q Okay. I just uploaded Exhibit 2. Let me 09:41:33 11 know if you see it.</p> <p>12 A Yes. Okay.</p> <p>13 (Exhibit 2 was marked for identification 14 electronically and is attached hereto.)</p> <p>15 BY MR. PAK: 09:41:57</p> <p>16 Q Do you recognize this document?</p> <p>17 A No.</p> <p>18 Q Okay. Well, I'll represent to you that these 19 are slides from a computer networks course from 20 Cornell University that I downloaded from the 09:42:11 21 internet.</p> <p>22 Do you see on the first page it says "CS519: 23 Computer Networks," correct?</p> <p>24 A I do.</p> <p>25 Q And it's a lecture from January 24, 2004, 09:42:18</p>

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1 right?	1 A First of all, I never heard that euphemism,
2 A Yes.	2 and I'm pretty familiar with the field of streaming
3 Q Okay. And I want to focus on the slide 6, so	3 audio and networks and use for that, and voice. I
4 PDF page 6.	4 think a voice network is a data network. It's
5 A They're not numbered. What is the title of 09:42:35	5 carrying voice data. 09:44:59
6 the slide?	6 Q Well, what is a voice network?
7 Q It says, "What is a data network?"	7 A It's a network that carries voice. For
8 A I see it.	8 example, a telephony network.
9 MR. KAPLAN: Chris, I don't mean to	9 Q Could you give me some other examples of a
10 interrupt, but if you sort of scroll your mouse over 09:42:48	10 voice network? 09:45:23
11 the exhibit, it will show the page numbers there.	11 A If we're talking about a network that only
12 THE WITNESS: Yeah, I just realized. But for	12 carries voice, then I think telephony is probably
13 some reason it's showing as page 5 for me. But,	13 the only one that comes to mind. There are other
14 okay, I do see it.	14 networks that carry voice and other things, like
15 BY MR. PAK: 09:43:00	15 cellular networks and cell phone networks. But if 09:45:42
16 Q I guess it is page 5. Page 5 of the PDF.	16 we're talking about just voice, then I would think
17 A Yes.	17 telephony is the -- I -- I just thought of another
18 Q And it says:	18 one. A walkie-talkie network that has multiple
19 "What is a data network?" And	19 wireless devices that a firefighter department would
20 then, "The answer is not a network 09:43:09	20 use, that is a voice network and it carries data. 09:46:01
21 that carries data."	21 Q So a walkie-talkie network, in your opinion,
22 Do you see that?	22 is a data network?
23 A I do.	23 A Well, I guess walkie-talkie network is --
24 Q And the slide explains that one reason why a	24 walkie-talkie is the devices on a wireless network
25 data network is not a network that carries data is 09:43:20	25 that exchange voice data. 09:46:25
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1 because you can send data over a voice network,	1 Q And what protocol does this wireless network
2 which is often a euphemism for a circuit network,	2 use to exchange voice data?
3 and a voice network is not a data network.	3 A Most of them are based on radio frequency,
4 Do you see that?	4 RF. But the protocols, again, I think are
5 A I do. 09:43:36	5 proprietary to the individual companies that make 09:46:48
6 Q Do you agree with that statement?	6 them, like Motorola and others.
7 A Not at all.	7 Q And when you say a telephony network, are you
8 Q Why do you disagree?	8 referring to a public switch telephone network?
9 A I think it's an appropriate statement for a	9 A Yes.
10 packet network course -- for a network course, it's 09:43:44	10 Q Okay. So a public switch telephone network 09:47:05
11 appropriate for that kind of class, but I don't	11 is a voice network; is that right?
12 think that's a general statement that is true	12 A Yes.
13 because data -- networks carry data. That's the	13 Q Is a cellular network a voice network?
14 very definition of a network.	14 A Well, as I said before, it can be a voice
15 I don't know this class, but it sounds like 09:44:09	15 network if all that anyone does on it is speak on 09:47:23
16 they're going to be talking about a subset of	16 the phone. But it is capable of other information
17 networks that carry packet data, and they certainly	17 as well on that network. So it's not exclusively
18 exist.	18 voice.
19 Q Well, you say you never taught a course in	19 Q So a cellular network can either transmit
20 computer networks; is that right? 09:44:22	20 voice or data, right? 09:47:36
21 A Yes.	21 A No.
22 Q Do you agree that a voice network is a	22 MR. KAPLAN: Object to form.
23 euphemism for a circuit network?	23 THE WITNESS: Voice -- a cellular network
24 A No. That is not a term of art.	24 transmits or carries data. Voice is data as far as
25 Q Why do you disagree? 09:44:32	25 it's concerned. 09:47:53
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<p>1 BY MR. PAK:</p> <p>2 Q Right. So a cellular network can carry data 3 in the form of voice, right, or non-voice data; is 4 that right?</p> <p>5 A Right. 09:48:05</p> <p>6 Q So how do you transmit voice data over a 7 cellular network?</p> <p>8 A Well, it depends on what kind of cellular 9 network. There are different kinds of cellular 10 networks. So the first ever created was probably, I 09:48:25 11 would say, in Japan in 1979 or 1980, somewhere 12 there. And it was an analog-based system where -- 13 and I guess at the time that would have been truly 14 for voice because I don't think there was other 15 multimedia data being sent over the network. 09:48:47</p> <p>16 So that was through a mechanism called 17 frequency division multiplexing, which basically is 18 a protocol for splitting up the audio bandwidth into 19 different bands and then dividing them into 20 different bands, and then blending them all together 09:49:04 21 when they arrive at the other end. So that was a 22 purely analog system. And, actually, it's still in 23 existence in some parts of the world.</p> <p>24 There are also digital systems, and they have 25 increased over the years from -- starting from 2G, 09:49:23</p>	<p>1 Sitting here today, you can't think of a 2 digital cellular network that is not packet based, 3 correct?</p> <p>4 A Correct, but that's not -- I'm not saying 5 that they don't exist, just that I can't think of 09:51:15 6 one.</p> <p>7 Q So you said in a cellular network, you can 8 either transmit voice data or non-voice data, right?</p> <p>9 A Right.</p> <p>10 MR. KAPLAN: Object to form. 09:51:35</p> <p>11 BY MR. PAK:</p> <p>12 Q So in a cellular network, is -- is voice data 13 transmitted differently than non-voice data? Do 14 they take different paths?</p> <p>15 MR. KAPLAN: Object to form. 09:51:50</p> <p>16 THE WITNESS: Well, it kind of depends. If 17 you're communicating with somebody else on another 18 cellular phone, for example, the path between you 19 and the other person may be different because of the 20 way cellular networks work. If you're using your 09:52:09 21 phone to send data to a device in your house, that 22 would be a different path as well.</p> <p>23 So I guess I wasn't fully clear on your 24 question.</p> <p>25 ////</p>
<p>1 which was the first one, all the way to what we have 2 today, which is 5G, increasing the bandwidth of each 3 connection and also total bandwidth to improve 4 quality and speed.</p> <p>5 Q So in a digital cellular network, what -- 09:49:47 6 when you transmit data, what -- what form does that 7 data take? Is -- does it have to take the form of 8 data packets?</p> <p>9 A The standards dictate the form. So there are 10 different schemes. There's time division 09:50:16 11 multiplexing, which was the next evolution after 12 frequency division. I would say, yes, the majority 13 of those are probably packet based.</p> <p>14 Q Are there any digital cellular networks that 15 are not packet based? 09:50:32</p> <p>16 A I don't know. That would be a pretty 17 sweeping statement for me to make without looking 18 into it a little bit more.</p> <p>19 I can't think of an example off the top of my 20 head, but I don't want to say no for sure because I 09:50:49 21 would have to look into it.</p> <p>22 Q Sitting here today, you can't think of any 23 digital cellular networks that are packet based -- 24 that are not packet based? Let me -- let me start 25 over. 09:51:04</p>	<p>1 BY MR. PAK:</p> <p>2 Q I want to go back to the slide here. It 3 says:</p> <p>4 "Data network is often a 5 euphemism for packet network." 09:52:36</p> <p>6 Do you agree with that statement?</p> <p>7 A I do not.</p> <p>8 Q And you disagree with the statement because a 9 data network is any type of network that carries 10 data; is that -- is that correct? 09:52:52</p> <p>11 A That's correct. And the data can be in many 12 different forms and it could be analog or digital. 13 But even within those, it can be different protocols 14 for each one of those.</p> <p>15 Q Is a voice network a packet network? 09:53:06</p> <p>16 MR. KAPLAN: Object to form.</p> <p>17 THE WITNESS: A voice network can be packet 18 based, yes. But there are many -- the original 19 PBX-type switches were not. Those were a voice 20 network that was analog. And then later other 09:53:31 21 networks came out that are digital.</p> <p>22 But analog voice networks still exist and are 23 in use in many places, including elevators for 24 safety and places where you want the internet not to 25 fail, especially for safety applications. 09:53:47</p>

1 BY MR. PAK:	1 destinations."
2 Q Okay. So an analog voice network is not a	2 Yes, I would agree with that.
3 packet network, correct?	3 BY MR. PAK:
4 A An analog -- no, it is not.	4 Q Can a circuit network be digital or analog?
5 Q Is a digital voice network a packet network? 09:54:0	5 A Yes. 09:56:39
6 A As I said before, most of them are. There	6 Q What's an analog -- what are some examples of
7 might be examples where they're not, but I don't	7 analog circuit networks?
8 know one off the top of my head. I would say most	8 A Well, those are the original telephony
9 are.	9 products that connect to POTS, plain old telephone
10 Q And I want to take a look at -- let me find 09:54:20	10 system lines. You still find limited -- you find 09:56:56
11 the right slide here. I think it's PDF page 9 of	11 them in network closets of many companies or other
12 the slides. The header says "Packet Network versus	12 organizations. So, yes, there are analog switching
13 Circuit Network."	13 or circuit networks that still exist.
14 Do you see that?	14 Q You said those are examples of an analog
15 A Yes. 09:54:44	15 voice network, right? 09:57:31
16 Q So this slide says:	16 A Right.
17 "Packet Network versus Circuit	17 Q So is a voice network not a circuit network?
18 Network. By contrast, packet network	18 A A voice network --
19 allows small units of data packets to	19 Q Let me ask you a different question.
20 be individually sent to different 09:54:55	20 Is a voice network synonymous -- synonymous 09:57:49
21 destinations."	21 with the term circuit network?
22 Do you see that?	22 A No.
23 A I do.	23 Q How are they different?
24 Q Can you send data packets over a circuit	24 A A circuit network is something that requires
25 network? 09:55:04	25 a physical connection to be made of the sending 09:58:02
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1 A Probably not. I'm trying to figure out what	1 location and the receiving location. You think of
2 the "by contrast" means here. Is there a previous	2 it as the old telephone operator plugging in patch
3 slide that contrasts to something?	3 cords. So that's a circuit network. What it
4 Q Yeah. So in the context, you know, the	4 carries is voice. And so I guess it's not a term
5 header says, "Packet Network versus Circuit	5 that I often use, but it is a term that I guess 09:58:21
6 Network." So "by contrast" here it's comparing a	6 people use calling it a voice network. You could
7 packet network to a circuit network; is that	7 send other things over an analog switching network.
8 correct?	8 Q And you said earlier that public switch
9 A Yes.	9 telephone network is a voice network, right?
10 Q So unlike a circuit network, this slide says: 09:55:42	10 A I said -- I don't remember what I said. The 09:58:41
11 "A packet network allows small	11 public switch network can be used as -- for voice.
12 units of data packets to be	12 Q Can a public switch telephone network be used
13 individually sent to different	13 in a circuit network?
14 destinations."	14 MR. KAPLAN: Object to form.
15 Is that right? 09:55:59	15 THE WITNESS: It's not to be used in. It's 09:59:05
16 MR. KAPLAN: Object to form.	16 implemented using circuit networks, or circuit
17 THE WITNESS: Right. But -- so in a digital	17 network devices.
18 switching -- a digital circuit network, that could	18 BY MR. PAK:
19 also be true, right?	19 Q Well, let me ask you this way. Is a voice
20 So I understand what they're trying to say 09:56:15	20 network a type of circuit network? 09:59:28
21 here for the purposes of this class that they're	21 A Yes.
22 teaching, but I guess reading the sentence by	22 Q Okay. I want to introduce a new exhibit
23 itself:	23 here, Exhibit 3. Just give me one minute.
24 "A packet network allows packets	24 (Exhibit 3 was marked for identification
25 of data to be sent to different 09:56:30	25 electronically and is attached hereto.) 10:00:11
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1 BY MR. PAK:	1 A Correct.
2 Q Okay. I just uploaded Exhibit 3. Let me	2 Q Why do you disagree?
3 know when you see it.	3 A Because I think we talked about several
4 A I see it.	4 examples of networks that carry analog signals, and
5 Q Do you recognize this document? 10:00:23	5 so it's not an opinion. I mean, the existence of 10:03:47
6 A I recognize maybe not this edition of it, but	6 those networks proves it doesn't have to be digital.
7 I have seen the computer dictionary before, yes.	7 Q And earlier, you know, as we discussed, your
8 Q Okay. Yeah, so this is an excerpt from the	8 opinion is that a voice network can transmit analog
9 Microsoft Computer Dictionary, Fifth Edition.	9 signals, but it can also transmit digital signals;
10 And you said you're not sure if you read this 10:00:44	10 is that correct?
11 edition, but you've looked through the Microsoft	11 A Yes.
12 Computer Dictionary before, right?	12 MR. KAPLAN: Object to form.
13 A Yes, I have.	13 THE WITNESS: Yeah, I agree with that.
14 Q I want to look at page 3. At the bottom, do	14 BY MR. PAK:
15 you see a definition for a data network? 10:01:04	15 Q Okay. Is local area network a term of art? 10:04:17
16 A Yes.	16 A Yes, it is.
17 Q Could you please read that definition for the	17 Q Before Google engaged you as an expert for
18 record?	18 this matter, did you have an understanding of what
19 A	19 local area network means?
20 "A network designed for 10:01:15	20 A Yes, I did. 10:04:31
21 transferring data encoded as digital	21 Q What was that understanding?
22 signals, as opposed to a voice	22 A It is a -- again, infrastructure or medium
23 network, which transmits analog	23 for connecting multiple devices for the purpose of
24 signals."	24 exchanging data.
25 Q So like the Cornell University slide we just 10:01:25	25 Q What are the types of devices that can be on 10:04:50
Page 46	Page 48
1 looked at, the Microsoft Dictionary distinguishes a	1 a local area network?
2 data network from a voice network, correct?	2 A They can be -- because I work a lot with
3 MR. KAPLAN: Object to form.	3 studios and other things, it can be mixing consoles,
4 THE WITNESS: That's what it says.	4 loudspeakers, computers, microphone preamplifiers,
5 BY MR. PAK: 10:01:48	5 printers. There's a very large list of things it 10:05:16
6 Q Do you agree with this definition of data	6 could be on this kind -- on a local area network.
7 network from the Microsoft Computer Dictionary?	7 Q A local area network can be wired or
8 A I agree with parts of it. A network designed	8 wireless, correct?
9 for transferring data. But I don't agree that it	9 A Yes.
10 has to be digital. 10:02:00	10 Q What are the types of cables used to transfer 10:05:29
11 Q What does transferring data mean?	11 data over a wired local area network?
12 A In this context, I think because it's	12 A It's similar to the list that we talked about
13 Microsoft, it means -- I assume it means data from	13 before in terms of data networks. It's copper and
14 one computer is moved to another computer.	14 all types of copper connections, including audio
15 Q So it talks about sending and receiving data, 10:02:31	15 cables, speaker cables, Ethernet, coaxial cables, 10:05:53
16 right?	16 optical cables. That's probably a good list.
17 A I don't -- maybe transferring means -- to me	17 Q So if a speaker is connected to the Sub
18 means taking it from one place to another. I don't	18 Equalizer, for example, via a RCA cable -- let me
19 see anything in this definition that implies it's	19 start over.
20 bidirectional. 10:02:53	20 So if a speaker is connected to another 10:06:24
21 Q What do you mean by "bidirectional"?	21 device, such as the Sub Equalizer via RCA cables, is
22 A Sending and receiving, as you said, between	22 that on a local area network?
23 two devices, for example.	23 A Yes. Those are exchanging data.
24 Q Okay. So this definition, you disagree that	24 Q Does a local area network require devices to
25 a data network is limited to digital signals, right? 10:03:29	25 transfer data in a certain format to communicate 10:06:51
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<p>1 with another device?</p> <p>2 A It does. The devices on that network have to 3 all have an agreed-upon representation of the data 4 or use an appropriate translator to make it 5 understandable to them, but yes. 10:07:08</p> <p>6 Q So devices on a local area network have to 7 communicate using a specific network protocol, 8 right?</p> <p>9 A Yes.</p> <p>10 Q What are those network protocols? 10:07:25</p> <p>11 A So there are -- again, because I come from 12 the audio world, there are modulation protocols, 13 such as pulse code modulation, pulse width 14 modulation, optical data protocols, which are 15 digital. Well, all the ones I mentioned are 16 digital.</p> <p>17 And then there are also the -- if we're 18 talking about printers and computers, then there are 19 the TCP internet protocols.</p> <p>20 Q Are these analog protocols or digital 21 protocols? 10:08:04</p> <p>22 A Well, I guess I don't think of a protocol as 23 analog or digital. It's -- there are protocols for 24 analog data and there are protocols for digital 25 data. Perhaps that's what you meant? 10:08:36</p>	<p>1 Q When you transmit digital data over a local 2 area network, does that data have to take the form 3 of digital data packets?</p> <p>4 A No, it doesn't have to.</p> <p>5 Q What other forms can that data take? 10:11:00</p> <p>6 A The examples I was giving before, some kind 7 of a modulation. So pulse code or pulse width 8 modulation. So, no, it doesn't have to be packet 9 based.</p> <p>10 Q When we talked about modulations, you 11 referred to them as analog data; is that right?</p> <p>12 A No. The one kind, frequency division, is the 13 analog. But the -- so pulse code and pulse width, 14 the examples I'm using here, require the translator 15 device. 10:11:54</p> <p>16 So let's say you have an audio device that's 17 sending out analog audio, but you want to connect it 18 over a local network to other devices to receive 19 that audio, the wired network. You might convert it 20 to digital audio and then use -- and that conversion 10:12:16 21 puts it in the forms of pulse code modulated or 22 pulse width modulated audio. Most common is pulse 23 code. It's sent over the network in that format and 24 then the opposite operation happens at the receiving 25 end. 10:12:37</p>
<p>Page 50</p> <p>1 Q Yeah, that's what I meant, actually.</p> <p>2 What are the protocols for analog data for a 3 local area network?</p> <p>4 A So they're modulated -- so FM is -- not the 5 radio kind of FM, but frequency or amplitude 10:09:02</p> <p>6 modulation of audio data can be sent over cables and 7 demodulated at the receiving side and be converted 8 back to audio. That's one that comes to mind for 9 analog.</p> <p>10 Q Are there any other protocols for analog data 10:09:26</p> <p>11 over a local area network?</p> <p>12 A The method that I talked about before for the 13 1G cellular networks, frequency division 14 multiplexing, that can also be applied to wired 15 local area networks as well. 10:09:50</p> <p>16 Q What are the protocols for digital data over 17 a local area network?</p> <p>18 A It depends on the data. So if it's -- again, 19 if we're talking about multimedia audio data, those 20 can be the ones that I mentioned before, the pulse 10:10:12</p> <p>21 code or pulse modulation or optical, SPDIF.</p> <p>22 If we're talking about computers and 23 printers, those are TCP-type protocols. But there 24 are others. There are peer-to-peer connections that 25 can happen. 10:10:36</p>	<p>Page 52</p> <p>1 So these converter devices are in many cases 2 built into the audio source and receiver and 3 sometimes they can be separate.</p> <p>4 Q So when you convert audio into digital form 5 in pulse code modulator or pulse width modulated 10:12:55</p> <p>6 audio data, and you transmit that over a network, 7 does that data have to take the form of data 8 packets?</p> <p>9 A No.</p> <p>10 Q What does that data -- what form can that 10:13:19</p> <p>11 data take other than data packets?</p> <p>12 A You can think of it as a stream of zeroes and 13 ones because it's digital now.</p> <p>14 I guess the best analogy I can think of is in 15 Morse code you can have a long beep or a short beep, 10:13:39</p> <p>16 and so the pulses can be wide to represent, let's 17 say, a one or short to represent a zero and then 18 that pattern is read in by the receiving device and 19 converts back to audio.</p> <p>20 Q Does an infrared remote that sends infrared 10:14:00</p> <p>21 signals to a TV amount to a coupling by way of a 22 local area network?</p> <p>23 A Yes. It's sending data to a TV in this case, 24 right? So over an agreed-upon protocol. So yes.</p> <p>25 Q So as long as data is being carried over to 10:14:36</p>

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<p>1 another device using some agreed-upon protocol, 2 you're saying that that is enough to be on a local 3 area network; is that right?</p> <p>4 MR. KAPLAN: Object. Form.</p> <p>5 THE WITNESS: It's enough to be on a network. 10:14:55</p> <p>6 Local area usually is used as a term of art to 7 differentiate it from larger networks. But, yes, I 8 agree.</p> <p>9 BY MR. PAK:</p> <p>10 Q What do you mean by a local area usually is 10:15:16 11 usually used as a term of art to differentiate it 12 from large networks?</p> <p>13 A The industry uses these terms to give an idea 14 of the magnitude of the size of the overall network.</p> <p>15 So they are, for example, wide area networks that 10:15:41 16 would consist possibly of multiple local area 17 networks and are generally considered to cover much 18 larger areas geographically. So it's kind of a 19 layered terminology. There are also metropolitan 20 area networks that typically are associated with a 10:16:03 21 city.</p> <p>22 There's no hard definition of where the 23 boundary of one ends and another one begins, but one 24 would understand that a wide area network involves a 25 much larger geographic area than a local area 10:16:16</p>	<p>1 Q Right. So there is a difference between a 2 data network and a local area network, right?</p> <p>3 A No. A local area network is a data network.</p> <p>4 But it has this additional attribute that is used to 5 compare it to larger data networks, which are called 10:18:13 6 wide area networks.</p> <p>7 Q What is -- where are those additional 8 attributes that make a data network a local area 9 network?</p> <p>10 A They are used in -- when making comparisons 10:18:27 11 between two networks to differentiate usually by the 12 number of devices or the geographical area that is 13 covered.</p> <p>14 So they're all data networks, but the wide -- 15 it's generally understood that a wider network has 10:18:48 16 many more devices or covers a wider geographical 17 area than a local area network.</p> <p>18 Q Are there any other additional attributes 19 that make a data network a local area network?</p> <p>20 A Not that I can think of at the moment, no. 10:19:04</p> <p>21 Q Do you know any examples of a wide area 22 network?</p> <p>23 A Yes. I don't know if there's a name for it, 24 but the Western United States internet 25 infrastructure is generally considered a wide area 10:19:37</p>
<p>Page 54</p> <p>1 network.</p> <p>2 Q So local area network covers a limited area 3 compared to a wider network; is that right?</p> <p>4 A I wouldn't say limited. It's just smaller 5 than the wide area network. All networks are 6 limited by area. Wide area networks are also 7 limited, perhaps to planet earth. But it's just a 8 terminology for relative size. So one would 9 understand a local area network has fewer devices on 10 it than a wide area network. 10:16:57</p> <p>11 Q Let me ask you this way, then. A local area 12 network covers a limited geographical area; is that 13 right?</p> <p>14 A As I said, a smaller geographic area. It can 15 be quite large. That's why I objected to "limited." 10:17:16</p> <p>16 It can be pretty big. And then you say, okay, what 17 about wide? Wide area network would be bigger.</p> <p>18 Q Correct, right. So local area network covers 19 a smaller geographical area than a wide area 20 network; is that right? 10:17:32</p> <p>21 A Yes.</p> <p>22 Q Is there a difference between a data network 23 and a local area network?</p> <p>24 A Well, a local area network is a subset of the 25 data networks. 10:17:56</p>	<p>Page 56</p> <p>1 network. Internet2 that we mentioned before is a 2 wide area network.</p> <p>3 Q Do you know any other examples of wide area 4 networks?</p> <p>5 A I would say satellite networks perhaps that 10:19:51 6 cover a part of the globe under their view are also 7 wide area networks.</p> <p>8 Q How do you transmit data over a satellite 9 network?</p> <p>10 A In multiple ways. It could be radio 10:20:22 11 frequency based modulation or it could be packet 12 based, like it is for cell phones or cell networks.</p> <p>13 Q Can you transmit analog data over a satellite 14 network?</p> <p>15 A Analog data -- I'm trying to think of -- for 10:20:41 16 example, a short-wave radio is a kind of a network 17 that uses analog data over large distances. It's 18 possible that it's rebroadcast through satellites. 19 I'm not sure. I think technically you can.</p> <p>20 I can't think of an example at the moment, 10:21:13 21 but there's no reason that you couldn't.</p> <p>22 Q Do you know any satellite networks that 23 transmit analog data?</p> <p>24 A Not off the top of my head. I mean, I know 25 an old example -- communication with the Apollo 10:21:33</p>

<p>1 astronauts was done through radio waves. Perhaps 2 eventually that became digital. But, no, I can't 3 think of an example off the top of my head. 4 Q Does data that is transmitted over a 5 satellite network have to take the form of data 10:21:55 6 packets? 7 A I don't think that's required, no. 8 Q What other forms of data can be transmitted 9 over a satellite network? 10 A There are other modulation schemes that can 10:22:09 11 be used. Radiofrequency modulation schemes can be 12 used to transmit data over satellites. 13 MR. PAK: How about we take a break, a quick 14 break? Maybe come back in five minutes. Is that 15 okay? 10:22:41 16 THE WITNESS: Sure. 17 THE VIDEOGRAPHER: We are off the record at 18 10:22 a.m. 19 (Recess.) 20 THE VIDEOGRAPHER: We are on the record at 10:30:10 21 10:30 a.m. 22 BY MR. PAK: 23 Q Dr. K., I want to explore a couple more 24 examples regarding local area networks. 25 A Okay. Before we get started, before you ask 10:30:25 Page 58</p>	<p>1 causes that. But yes. 2 Q Are there any other differences between a 3 local area network and a personal area network? 4 A Probably the number of devices in a local 5 area network would be higher than the number of 10:32:24 6 devices in a personal area network that are 7 possible. 8 Q Are there any other differences between local 9 area network and a personal area network? 10 A I can't think of one, no. 10:32:36 11 Q So earlier you said, you know, communicating 12 over two walkie-talkies could amount to a coupling 13 by way of a data network, right? 14 A Yes. 15 Q And that's because you can carry data from 10:33:04 16 one walkie-talkie to another walkie-talkie, correct? 17 A Correct. 18 Q What if I just had, you know, two cups on a 19 string and I used that to communicate with George, 20 who is right by me, is that on a data network? 10:33:25 21 MR. KAPLAN: Object to form. 22 THE WITNESS: That's a bit of an extreme 23 example, but if your voice carried over the string 24 and the string was carefully selected and there was 25 no background noise, yeah, it's data. Your data is 10:33:46 Page 60</p>
<p>1 your question, I -- as I was walking upstairs, I 2 thought of an example, if I could amend my previous 3 answer. 4 An example of analog communication over 5 satellites is of course the obvious one, broadcast 10:30:38 6 television. Early days of broadcast television was 7 analog signals being sent over satellite. That's an 8 obvious one. Okay. 9 Q Does a cell phone communicate with a 10 Bluetooth headset amount to a coupling by way of 10:31:07 11 local area network? 12 A Yes. 13 Q Wasn't Bluetooth a type of personal area 14 network? 15 A Again, these definitions are kind of 10:31:26 16 arbitrary in the sense that there is no hard line of 17 distance that goes from one to the other. It's a 18 small local area network, but if I have a speaker 20 19 feet away from me communicating by Bluetooth, then 20 maybe that could be a local area network. It's not 10:31:46 21 a hard definition. 22 Q Does local area network cover a broader 23 geographical area than a personal area network? 24 A By consensus of people in the field thinking 25 of it that way. It's not something technical that 10:32:07 Page 59</p>	<p>1 getting across to somebody else to another device. 2 Not a very sophisticated one, but yes. 3 BY MR. PAK: 4 Q So as long as two devices or two nodes carry 5 data, that's going to be on a data network, in your 10:34:02 6 opinion? 7 A Yes. 8 MR. PAK: Okay. I'm going to introduce 9 Exhibit 4. I actually uploaded it on the break and 10 marked it as Exhibit 4. Just let me know when you 10:34:27 11 see it. 12 THE WITNESS: I see it. 13 (Exhibit 4 was marked for identification 14 electronically and is attached hereto.) 15 BY MR. PAK: 10:34:45 16 Q Do you recognize this document? 17 A Yes. 18 Q This is your -- this is one of your 19 publications; is that right? 20 A That's right. 10:34:51 21 Q And the title says, "RMI System: Internet 22 Meets the Future Home Theater," right? 23 A Correct. 24 Q At a high level, what is this publication 25 about? 10:35:07 Page 61</p>

<p>1 A This describes a set of experiments that 2 actually relates to the Internet2 discussion that we 3 had earlier. RMI stands for Remote Media Immersion. 4 And for several years there was -- I was a faculty 5 investigator and then eventually a deputy director 10:35:30 6 of the National Science Foundation Engineering 7 Research Center that was established at USC, and 8 this was one of the kind of capstone experiments 9 that we did to push the limits of multimedia at the 10 time. This was in the late 1990s. 10:35:47</p> <p>11 And so this paper talks about what 12 technologies would you -- would one need and how 13 would we use them to deliver what appears like high 14 quality representation of reality to somebody that 15 is far away. 10:36:06</p> <p>16 Q What was your contribution with respect to 17 this paper?</p> <p>18 A So several parts. It was the algorithms for 19 capturing audio on one end. Algorithms for 20 delivering it on the other end. Those were, I would 10:36:32 21 say, individual contributions.</p> <p>22 And then there were collaborative 23 contributions in working with the researchers and 24 computer networks to develop methods together that 25 met the requirements of multichannel audio, 10:36:48</p>	<p>1 concurrently."</p> <p>2 Then the last sentence on that page says: 3 "Each cluster node is attached to 4 a local network switch with a fast or 5 Gigabit Ethernet link. The nodes 10:38:41 6 communicate with each other and send 7 the media data via these network 8 connections. We connected the local 9 switch to both a wide area network 10 backbone to serve distant clients and 10:38:51 11 a local area network, LAN, environment 12 with local clients."</p> <p>13 Do you see that?</p> <p>14 A I do.</p> <p>15 Q So looking at Figure 1, what are the cluster 10:39:05 16 nodes?</p> <p>17 A What are in terms of --</p> <p>18 Q What are the cluster nodes with respect to 19 Figure 1? Can you point to them or show me -- tell 20 me -- 10:39:28</p> <p>21 A It's the ones that are labeled Node 0, 22 Node 1, Node 2, Node N. It was scalable.</p> <p>23 Q What is a node?</p> <p>24 A A node is I think a network -- people speak 25 for a connection of a device to the point of 10:39:53 Page 62</p>
<p>1 immersive audio, that were very different from the 2 requirements of sending faxes and e-mails in terms 3 of quality of service, forward error correction, and 4 other things like that.</p> <p>5 Q Okay. And I want to look at PDF page 4, 10:37:12 6 Figure 1.</p> <p>7 Do you see that?</p> <p>8 A Yes.</p> <p>9 Q Did you design this architecture shown in 10 Figure 1? 10:37:29</p> <p>11 A This architecture is -- this is all 12 off-the-shelf equipment. It's computers and hard 13 disks and Ethernet switch and computers at the other 14 side. So this was not -- we discussed how to put 15 them together and all agreed that this is how we 16 would need to do it in order to achieve our goal. 17 But the individual pieces are off-the-shelf 18 components.</p> <p>19 Q Okay. And, you know, I want to take a look 20 at the bottom of page -- PDF page 3 here, the last 21 paragraph. It says:</p> <p>22 "Figure 1 (next page) shows the 23 server cluster architecture, which can 24 harness the resources of many nodes 25 and many disk drives per node 10:38:26</p>	<p>1 connection between a device like a computer or 2 server to the network.</p> <p>3 Q And a local switch described in your 4 publication is the Ethernet switch shown in 5 Figure 1; is that right? 10:40:10</p> <p>6 A Right.</p> <p>7 Q And the internet showing here in Figure 1 8 represents the wide area network backbone described 9 in your publication; is that right?</p> <p>10 A Correct. 10:40:22</p> <p>11 Q Does Figure 1 also depict a local area 12 network environment with local clients?</p> <p>13 A Well, the personal computers shown there are 14 on a local area network. The ones where the nodes 15 were indicated. 10:40:45</p> <p>16 Q So the nodes here represent personal 17 computers; is that right?</p> <p>18 A I think node is a term which -- it's the 19 device -- nodes to me represent connections, the 20 connection points. They happen to be parts of a 10:41:11 21 computer, an interface that the computer has to 22 create that node.</p> <p>23 So I wouldn't -- the computer itself is not 24 the node. I think the fact that it has a connection 25 at that point makes -- creates a node as kind of an 10:41:31 Page 63</p>

<p>1 entryway to that network.</p> <p>2 Q I want to take a look at the bottom</p> <p>3 paragraph, the left column of PDF page 4. The last</p> <p>4 sentence says:</p> <p>5 "VBR streams enhance the 10:41:54</p> <p>6 rendering quality, but they generate</p> <p>7 bursty traffic on a packet-switched</p> <p>8 network such as the Internet. In</p> <p>9 turn, this can easily lead to packet</p> <p>10 loss due to congestion." 10:42:04</p> <p>11 Do you see that?</p> <p>12 A Yes.</p> <p>13 Q Your publication here teaches that the</p> <p>14 Internet is a packet network, correct?</p> <p>15 A Yes. 10:42:14</p> <p>16 Q Looking at the last sentence of the next</p> <p>17 paragraph, it says:</p> <p>18 "To avoid traffic bottlenecks,</p> <p>19 each node transmits the data blocks</p> <p>20 that it holds directly to the clients 10:42:29</p> <p>21 via RTP. Hence, each client will</p> <p>22 receive RTP data packets from each</p> <p>23 server node within the cluster."</p> <p>24 Do you see that?</p> <p>25 A I do. 10:42:41</p>	<p>1 shown in Figure 1 transmit data packets over a wide</p> <p>2 area network; is that correct?</p> <p>3 A Well, they first go over a local area network</p> <p>4 into the switch, and then the switch multiplexes</p> <p>5 them all together and puts them onto the line that 10:44:55</p> <p>6 goes to the wide area network, as shown at the top</p> <p>7 through fast Ethernet or Gigabit Ethernet.</p> <p>8 Q Sure. So let me correct that here.</p> <p>9 So nodes communicate with the Ethernet switch</p> <p>10 over a local area network, correct? 10:45:09</p> <p>11 A Correct.</p> <p>12 Q And these nodes send data packets to the</p> <p>13 internet switch; is that correct?</p> <p>14 A Yes. In this architecture, yes.</p> <p>15 Q And in this architecture, the Ethernet switch 10:45:21</p> <p>16 connects to the -- or communicates over the internet</p> <p>17 and sends data packets over the internet; is that</p> <p>18 correct?</p> <p>19 A Right. Where it says "internet backbone</p> <p>20 routers," those are -- exist -- there's a connection 10:45:39</p> <p>21 in USC's IT building and that's -- so if we went</p> <p>22 from there to that router, then that router then has</p> <p>23 a direct line to the wide area internet. In this</p> <p>24 case, it was Internet2. Not the general internet,</p> <p>25 but a similar type of network. 10:45:58</p>
<p>1 Q What is RTP?</p> <p>2 A I think it's retransmission protocol. It's a</p> <p>3 type of protocol that enables error correction. In</p> <p>4 case there are lost packets, they are re-requested</p> <p>5 before they're stitched back together to avoid 10:43:00</p> <p>6 dropouts.</p> <p>7 This was one of the big things we had to</p> <p>8 worry about. You don't want audio dropouts. It</p> <p>9 does not make for a high-quality experience.</p> <p>10 Q Is RTP a type of internet protocol? 10:43:12</p> <p>11 A No. I would say UDP is an internet protocol,</p> <p>12 User Datagram Protocol, UDP is a type of internet</p> <p>13 protocol. And you can enable, if you will, or</p> <p>14 include in it a method like RTP that provides for</p> <p>15 the ability to correct errors that happen because of 10:43:43</p> <p>16 lost packets.</p> <p>17 Q Does UDP require data to be transmitted or</p> <p>18 received in the form of data packets?</p> <p>19 A Yes.</p> <p>20 Q So does RTP, right? 10:43:59</p> <p>21 A RTP is -- it's not a transmission -- it's not</p> <p>22 the same. Yes, RTP operates on packets to figure --</p> <p>23 and requests retransmission of ones that are missing</p> <p>24 based on what it was expecting, in simple terms.</p> <p>25 Q Okay. So looking at Figure 1, the nodes 10:44:26</p>	<p>1 Q Okay. I want to introduce Exhibit 5 here.</p> <p>2 Give me one second.</p> <p>3 Okay, I just uploaded Exhibit 5 and marked it</p> <p>4 as Exhibit 5. Let me know when you see it.</p> <p>5 A I see it. 10:46:21</p> <p>6 (Exhibit 5 was marked for identification</p> <p>7 electronically and is attached hereto.)</p> <p>8 BY MR. PAK:</p> <p>9 Q Do you recognize this document?</p> <p>10 A Yes. It's one of my patents. 10:46:33</p> <p>11 Q So you're a co-inventor of this patent,</p> <p>12 correct?</p> <p>13 A Yes.</p> <p>14 Q And the patent number is 8,705,764, right?</p> <p>15 A Yes. 10:46:47</p> <p>16 Q At a high level, what does this patent</p> <p>17 generally disclose?</p> <p>18 MR. KAPLAN: Object to form.</p> <p>19 THE WITNESS: We were trying to solve a</p> <p>20 problem that happens when you take audio -- you 10:47:05</p> <p>21 start with analog audio and then you digitize it</p> <p>22 into a high quality digital form. And then in order</p> <p>23 to store it perhaps on a portable device, one of</p> <p>24 many different data compression algorithms are used.</p> <p>25 MPEG being the most popular, but there are others 10:47:30</p>

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<p>1 like AAC.</p> <p>2 The result of that compression is that the 3 higher frequencies of sound that were in the 4 original tend to be discarded in the name of 5 bandwidth savings. And so this patent teaches a 10:47:44 6 method to recreate the lost high frequencies using 7 information that is in the lower frequencies that 8 did not get discarded.</p> <p>9 BY MR. PAK:</p> <p>10 Q I want to focus on Column 11. It's on PDF 10:48:04 11 page 21, lines -- lines 55 to 60. It's the last 12 sentence before the last paragraph.</p> <p>13 Could you please read those lines for me for 14 the record.</p> <p>15 A Is this the "Various embodiments" paragraph? 10:48:25</p> <p>16 Q The sentence right above it.</p> <p>17 A "The connectivity between the modules"? That 18 one?</p> <p>19 Q Yes, that one.</p> <p>20 A Okay.</p> <p>21 "The connectivity between the 22 modules and/or components within the 23 modules may be provided using any one 24 of the connectivity methods and media 25 that is known in the art, including, 10:48:52</p>	<p>1 protocols.</p> <p>2 To be clear, the patent is really not about 3 connecting -- it's just saying that the modules that 4 we're discussing here that are going to do advanced 5 audio processing don't necessarily have to be in one 10:51:30 6 device, they can be spread out, distributed. That 7 was the point of that paragraph.</p> <p>8 BY MR. PAK:</p> <p>9 Q What is the OSI protocol?</p> <p>10 A It's a -- the best way to describe it, it's 10:51:48 11 an attempt at abstracting the individual layers that 12 are required in a network system all the way from 13 the hardware layer to the firmware to the software 14 that needs to run on top of it, to the physical 15 connections, in a way that provides a more uniform 10:52:16 16 way for people that are trying to send data over 17 these kinds of networks without having to know 18 exactly what type of device was there.</p> <p>19 So it moves it up to be a more abstract 20 representation of the interface of the network. I 10:52:34 21 believe there are seven layers in it that -- in that 22 stack.</p> <p>23 Q Does the data that is transmitted using the 24 OSI protocol require data packets, data transmitted 25 in the form of data packets? 10:53:01</p>
<p>Page 70</p> <p>1 but not limited to, communications 2 over the internet, wired or wireless 3 networks using the appropriate 4 protocols."</p> <p>5 Q So it talks about communications over the 10:49:01 6 internet using the appropriate protocols. What are 7 the appropriate protocols communicated over the 8 internet?</p> <p>9 A It's been a little while since I've seen 10 this, so just give me a second to take a look and 10:49:18 11 put it in context.</p> <p>12 Q Sure. Go ahead, take your time.</p> <p>13 A Yeah. Okay. It's all coming back.</p> <p>14 Q Okay. So let me re-ask the question here.</p> <p>15 What are the appropriate protocols to 10:50:17 16 communicate over the internet?</p> <p>17 A It's what we talked about before. If it's 18 the internet as we have it today, it's TCP/IP or 19 peer-to-peer or UDP, as we just saw.</p> <p>20 Q Are there any other protocols? 10:50:39</p> <p>21 MR. KAPLAN: Object to form.</p> <p>22 THE WITNESS: There are others. There's -- 23 let's see. OSI is another one, Open System 24 Interfaces. There are probably others I'm not 25 remembering. There are a number of these internet 10:51:11</p>	<p>Page 72</p> <p>1 A Yes, it's a packet-based system.</p> <p>2 Q Okay. I want to look at Column 9, lines 20 3 to 24 of your patent. And I'm just paraphrasing 4 here, but it says that the output is characterized 5 by a transfer function. 10:53:27</p> <p>6 Do you see that?</p> <p>7 A I do.</p> <p>8 Q What does the term "characterize" mean?</p> <p>9 A In this context it means that -- so we're 10 talking about a system. A system has inputs and 10:53:43 11 outputs. And typically when you do system analysis, 12 you want to find a way to describe the output in 13 terms of the input signal.</p> <p>14 And so the transfer function in this context 15 says that if I have -- if I know what the amplitude 10:53:58 16 level was to this box and I know what the transfer 17 function is, then I can tell you what the output is.</p> <p>18 Q Do you know any words or phrases that are 19 synonymous with the term "characterize"?</p> <p>20 MR. KAPLAN: Object to form. 10:54:17</p> <p>21 THE WITNESS: I'm trying to think of it in 22 this context, and not just generally.</p> <p>23 What it really means here is mathematically 24 described. Because we're talking about this 25 equation here. That would be the closest I can 10:54:41</p>

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<p>1 think of.</p> <p>2 BY MR. PAK:</p> <p>3 Q Can you think of any other words or phrases</p> <p>4 that are synonymous with "characterize"?</p> <p>5 A Not off the top of my head, no. 10:54:53</p> <p>6 Q But "describe" would be one of the terms that</p> <p>7 is synonymous with "characterize," right?</p> <p>8 MR. KAPLAN: Object to form.</p> <p>9 THE WITNESS: Yeah, but I don't want to -- in</p> <p>10 math we say mathematically described, so I would be 10:55:11</p> <p>11 more comfortable keeping it that way.</p> <p>12 BY MR. PAK:</p> <p>13 Q What about defined?</p> <p>14 MR. KAPLAN: Object to form.</p> <p>15 THE WITNESS: Defined has a different meaning 10:55:24</p> <p>16 to me. A definition in math or applied math means</p> <p>17 that you're making some assumptions and defining</p> <p>18 them. But that's not what is happening here.</p> <p>19 This is a -- an equation that has certain</p> <p>20 elements. And so the system is characterized by 10:55:47</p> <p>21 this transfer function. So I think describe</p> <p>22 mathematically is more accurate.</p> <p>23 BY MR. PAK:</p> <p>24 Q What if I say -- what if we change "the</p> <p>25 output is characterized by a transfer function" to 10:56:04</p> <p>Page 74</p>	<p>1 Q Okay. Let me try to introduce another</p> <p>2 exhibit here.</p> <p>3 I just uploaded a new exhibit and marked it</p> <p>4 as Exhibit 6. Let me know when you see it.</p> <p>5 A I see it. 10:58:25</p> <p>6 (Exhibit 6 was marked for identification</p> <p>7 electronically and is attached hereto.)</p> <p>8 BY MR. PAK:</p> <p>9 Q Do you recognize this document?</p> <p>10 A Yes, it is another one of my publications. 10:58:35</p> <p>11 Q The title of the publication is "High Quality</p> <p>12 Multichannel Audio Over the Internet," right?</p> <p>13 A Yes.</p> <p>14 Q What was your contribution to this</p> <p>15 publication? 10:58:51</p> <p>16 A These are two students in the center. One of</p> <p>17 them was in my group and the other one was in the</p> <p>18 networking group. And this was a paper that --</p> <p>19 similar to the previous one, it was trying to figure</p> <p>20 out ways to transmit high quality audio over the 10:59:09</p> <p>21 internet.</p> <p>22 And the reason that it was an interesting</p> <p>23 topic was that it was really not possible to</p> <p>24 transmit high quality audio over the internet, at</p> <p>25 least not in the early days. And so this paper 10:59:23</p> <p>Page 74</p>
<p>1 "the output is represented by a transfer function,"</p> <p>2 would that be accurate?</p> <p>3 MR. KAPLAN: Object to form.</p> <p>4 THE WITNESS: I don't think so because</p> <p>5 "represented" to me means it's not the thing, but 10:56:23</p> <p>6 it's being represented by something else. And</p> <p>7 that's not technically correct here. This H</p> <p>8 function is the function.</p> <p>9 BY MR. PAK:</p> <p>10 Q What if you say "the output indicates a 10:56:42</p> <p>11 transfer function," would that be incorrect?</p> <p>12 A No. That would be something completely</p> <p>13 different and it would indicate that there might be</p> <p>14 an output or something, but that's not -- this is a</p> <p>15 deterministic system, and so no. 10:57:00</p> <p>16 Q Well, looking at the equation here, the</p> <p>17 output Y equals the transfer function times the</p> <p>18 sinusoid input, S-I-N-U-S-O-I-D.</p> <p>19 So the output function here indicates the</p> <p>20 transfer function and the sinusoid input, right? 10:57:35</p> <p>21 A No.</p> <p>22 Q It provides some kind of indication of it?</p> <p>23 A No, no. This is a way to calculate the</p> <p>24 output function. So it is calculated by multiplying</p> <p>25 the transfer function with the complex sinusoid. 10:57:53</p> <p>Page 75</p>	<p>1 shows some ways of doing that.</p> <p>2 Q Let's take a look at the abstract. The</p> <p>3 second sentence here says:</p> <p>4 "We present a robust scalable</p> <p>5 architecture for delivering 10:59:44</p> <p>6 uncompressed multichannel audio over</p> <p>7 high bandwidth ATM networks."</p> <p>8 Do you see that?</p> <p>9 A I do.</p> <p>10 Q Is an ATM network a type of data network? 10:59:54</p> <p>11 A Yes.</p> <p>12 Q Is that because an ATM network carries data?</p> <p>13 A Actually, I should revise it.</p> <p>14 ATM network is a -- is a protocol for</p> <p>15 transmitting data over data networks. It stands for 11:00:10</p> <p>16 Asynchronous Transfer Mode, so it's a method of</p> <p>17 transmitting data over networks, over data networks.</p> <p>18 Q So an ATM network is not an actual network,</p> <p>19 it's a protocol; is that right?</p> <p>20 A Right. There's a -- there's a network 11:00:29</p> <p>21 architecture that has connectors and switches and</p> <p>22 things that have to support the ATM protocol in</p> <p>23 order to have an ATM network of devices.</p> <p>24 Q Okay. Looking at the abstract, it says:</p> <p>25 "Performance results from our 11:00:52</p> <p>Page 75</p> <p>Page 77</p>

1 implementation on a high-speed local 2 area ATM network are presented that 3 identify the effects of audio packet 4 size, buffering, and network latency 5 on the quality of multichannel program 6 material." 7 Do you see that? 8 A I do. 9 Q So is a high-speed local area ATM network a 10 network protocol or a data network? 11 A No. This is -- this sentence is kind of 12 conflating to me. It's a local area network running 13 the ATM protocol for purposes of this experiment. 14 Q Got it. 15 A So it requires different hardware. A TCP 16 local area network would require a different 17 hardware than an ATM protocol local network. 18 Sometimes they can be in the same box, but usually 19 it's different. 20 Q So your publication here is talking about a 21 local area network that uses the ATM protocol; is 22 that correct? 23 A Right. 24 Q Did you design and implement the local area 25 network that uses this ATM network described in this	11:01:05 11:01:16 11:01:32 11:01:48 11:02:04 Page 78	1 screens, do this, change that, let's try this 2 exercise. And so it's hard to break it up into an 3 individual. 4 BY MR. PAK: 5 Q Yeah, understood. 11:04:04 6 So how about maybe -- let's take a look at 7 the last page, PDF page 6, and there's an 8 acknowledgment section. It says: 9 "The authors would like to thank 10 Dr. SherAli Zeadally" -- 11:04:18 11 I might be botching that name. 12 A No, that's all right. 13 Q So let me read it again. 14 "The authors would like to thank 15 Dr. SherAli Zeadally for his work in 11:04:30 16 its design and implementation of the 17 ATM network." 18 Do you see that? 19 A I do. 20 Q So Dr. Zeadally is the one who actually 11:04:39 21 designed and implemented the local area network that 22 uses the ATM network described in this publication, 23 correct? 24 A Well, so he was a collaborator on this. The 25 second author in the paper was a joint student, so 11:04:54 Page 80
1 publication? 2 A If you look in Figure 1 of the next page, 3 this is a similar simpler diagram than -- compared 4 to the one that we saw before with the RMI network. 5 So we designed this architecture or this set 6 of components that are all off-the-shelf audio 7 parts, and you can see the ATM adapter inside the 8 computer that allows you to put out onto the network 9 data that follows the ATM protocol. And then 10 there's the playback application on the top. 11:02:54 11 So, yeah, we designed this architecture, but 12 it consists of computers and switches and wires that 13 are off the shelf and software that we put inside it 14 to do what we -- to run this experiment. 15 Q And when you say that "we designed," are you 11:03:09 16 saying that you designed the network described in 17 Figure 1, for example? 18 MR. KAPLAN: Object to the form. 19 THE WITNESS: The way collaborative papers 20 work is this is a group, you know, we have group 11:03:31 21 meetings. We designed the experiment and then have 22 regular kind of intervals of meeting and discussing. 23 So if you're asking who designed each 24 individual part, it's hard to say because we had 25 joint code sessions where we all sat in front of the 11:03:53	Page 79	1 he was -- Mr. Zhu was Dr. Zeadally's student. 2 Dr. Zeadally's lab was doing experiments with ATM 3 networks, and they had the infrastructure that we 4 were looking for in terms of switches and the right 5 cables and so on. 11:05:17 6 So I think this is kind of -- because he 7 wasn't part of this particular experiment, he is not 8 a co-author, but we used his lab where he had kind 9 of a tabletop network for us to experiment with 10 these protocols. 11:05:34 11 Q Okay. I want to take a look at PDF page 3. 12 And there's a header 3 that says, "Experimental 13 Results". 14 A Yes. 15 Q Could you read the first two sentences under 11:05:51 16 that header? 17 A Yes. 18 "In order to assess the effects 19 of packet size and buffer size on the 20 quality of the audio streams 11:06:01 21 transmitted through the network, as 22 well as on the delay introduced by the 23 system, we performed a series of 24 tests." 25 The next one as well? 11:06:13 Page 81

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<p>1 Q You know, that's fine.</p> <p>2 A Okay.</p> <p>3 Q So this publication discloses a system</p> <p>4 architecture in which data packets are transmitted</p> <p>5 over a local area network that uses the ATM 11:06:25</p> <p>6 protocol; is that correct?</p> <p>7 A Well, this publication was not intended to</p> <p>8 disclose the architecture. It was more intended to</p> <p>9 use the architecture to experiment with what needs</p> <p>10 to be changed or fixed or, you know, what matters in 11:06:39</p> <p>11 high-quality audio transmission over a network that</p> <p>12 has the bandwidth and the architecture that could</p> <p>13 enable it. We just didn't know what the right</p> <p>14 architecture was for transmitting audio in terms of</p> <p>15 the buffer size and packet sizes, and so on. 11:06:56</p> <p>16 So it was more of an experimental paper that</p> <p>17 uses a network architecture based on the ATM system</p> <p>18 that was kind of local to us there so we could</p> <p>19 change things in it.</p> <p>20 Q All right. So the publication describes a 11:07:09</p> <p>21 local area network that uses the ATM protocol to</p> <p>22 transmit data packets, right?</p> <p>23 MR. KAPLAN: Object to form.</p> <p>24 THE WITNESS: The publication describes an</p> <p>25 experiment that was conducted on the system we just 11:07:24</p>	<p>1 Science Foundation.</p> <p>2 It's related to an experiment that we did</p> <p>3 with the New World Symphony based in Miami. And it</p> <p>4 was similar to the RMI experiment trying to --</p> <p>5 trying to deliver high-quality performance that is 11:09:57</p> <p>6 convincing you to feel like you're in the concert</p> <p>7 hall with them, even though you are 3,000 to 4,000</p> <p>8 miles away.</p> <p>9 We actually demonstrated this live to an</p> <p>10 audience of several hundred people. It was the 11:10:10</p> <p>11 first time that it had ever been done at that scale.</p> <p>12 BY MR. PAK:</p> <p>13 Q This publication talks about HYDRA. It's</p> <p>14 abbreviation for high resolution live streaming.</p> <p>15 What is HYDRA? 11:10:26</p> <p>16 A So HYDRA was -- Professor Zimmerman that you</p> <p>17 see there at the top, his laboratory and his</p> <p>18 research group was experimenting with using similar</p> <p>19 things that we talked about before using the UDP</p> <p>20 protocol with error correction to deliver 11:10:52</p> <p>21 high-quality content and overcome the problems that</p> <p>22 normally arise with traditional ways of doing that,</p> <p>23 for example, TCP, which were not designed for</p> <p>24 streaming media. They were designed for offline --</p> <p>25 it's okay if you can wait a second before you get 11:11:13</p>
<p>1 described.</p> <p>2 BY MR. PAK:</p> <p>3 Q Can you send data over a local area network</p> <p>4 using the ATM protocol in the form of data that is</p> <p>5 not a data packet? 11:07:51</p> <p>6 A No. The ATM protocol is a packet-based</p> <p>7 protocol.</p> <p>8 Q Okay. I want to introduce another exhibit</p> <p>9 here, so just give me a minute.</p> <p>10 Okay. I just introduced Exhibit 7. Let me 11:08:45</p> <p>11 know when you see it.</p> <p>12 A I see it.</p> <p>13 (Exhibit 7 was marked for identification</p> <p>14 electronically and is attached hereto.)</p> <p>15 BY MR. PAK: 11:08:51</p> <p>16 Q Do you recognize this document?</p> <p>17 A Yes.</p> <p>18 Q At a high level, what does this publication</p> <p>19 describe?</p> <p>20 MR. KAPLAN: Object to form. 11:08:58</p> <p>21 THE WITNESS: I don't know if this was an</p> <p>22 actual publication. This was more of an internal --</p> <p>23 more kind of like a white paper. I don't remember</p> <p>24 the origin of it. It could be part of a report that</p> <p>25 was presented to the annual review by the National 11:09:14</p>	<p>1 your e-mail, but you can't wait to get the next</p> <p>2 audio packet, right? So that's what HYDRA is. It</p> <p>3 was trying to do that.</p> <p>4 Q Okay. And I want to take a look at the</p> <p>5 second section, the Statement of Project Goals. And 11:11:27</p> <p>6 in the middle of that section, the publication says:</p> <p>7 "This project focuses on the</p> <p>8 design of a system that enables HD</p> <p>9 quality video and multiple channels of</p> <p>10 audio to be streamed across an 11:11:43</p> <p>11 IP-based network with commodity</p> <p>12 equipment."</p> <p>13 Do you see that?</p> <p>14 A Sorry. The middle section -- I missed where</p> <p>15 you pointed. 11:11:52</p> <p>16 Q Yeah. So in the middle of Section 2,</p> <p>17 Statement of Project Goals --</p> <p>18 A Oh, yes. I see it.</p> <p>19 Q Okay. What is an IP-based network as</p> <p>20 described in this publication? 11:12:06</p> <p>21 A It's an internet protocol based network,</p> <p>22 which is kind of a very common type of protocol for</p> <p>23 transmitting data over the internet.</p> <p>24 Q Okay. And the second page here, Section 4,</p> <p>25 the second to last paragraph -- second sentence -- 11:12:30</p>

<p>1 second to last sentence in the first paragraph, it 2 says:</p> <p>3 "The transmission subsystem uses 4 the Realtime Transport Protocol, RTP, 5 on top of the Universal Datagram 6 Protocol, UDP."</p> <p>7 Do you see that?</p> <p>8 A Yes.</p> <p>9 Q So this publication is talking about an 10 IP-based network that uses UDP; is that right?</p> <p>11 A That's right. Those are subsets of an 12 IP-type network, just as TCP is.</p> <p>13 Q I want to take a look at the system 14 architecture shown on Figure 1 of that page.</p> <p>15 A Yes. 11:13:14</p> <p>16 Q Do you see the stream transmitter/receiver in 17 the figure?</p> <p>18 A Yes.</p> <p>19 Q What does the stream transmitter/receiver do?</p> <p>20 A That's -- that's a piece of software that's 11:13:25 21 kind of like the core of the HYDRA system. It takes 22 in multiple channels of microphones in this example 23 of a live recording, multiple cameras, and kind of 24 packages them together to send over the network by 25 paying attention to things that we talked about 11:14:03</p>	11:12:45	11:12:55	11:13:14	11:13:25	11:14:03	Page 86	<p>1 Q This is another one of your publications, 2 correct?</p> <p>3 A Yes.</p> <p>4 Q What does this publication describe?</p> <p>5 MR. KAPLAN: Object to form. 11:15:51</p> <p>6 THE WITNESS: This is another one of the same 7 kind of sequence of experiments we've been 8 discussing, which is high fidelity picture and sound 9 transmitted in a synchronized way over the Internet2 10 in this case. This particular one was trying to 11:16:08 11 understand what happens when you have an interactive 12 section.</p> <p>13 So it's one way to stream in one direction to 14 an audience far away. It's another way when you 15 need to have two-way communication. Because in this 11:16:27 16 example, we had two musicians and they are supposed 17 to play a piano piece together, each on their own 18 piano. And musicians require, of course, very 19 accurate timing between them in order to perform.</p> <p>20 So by adjusting -- artificially adjusting the 11:16:44 21 delay between the two of them is what -- how they 22 would hear the other side. And we were looking for 23 what the limits are of human performance over 24 networks.</p> <p>25 ////</p>	11:16:08	11:16:27	11:16:44	23	Page 88
<p>1 before, error correction and other things.</p> <p>2 Q What is the form of data that is transmitted 3 or received over the IP-based network disclosed in 4 this system architecture?</p> <p>5 A Well, it's what it says on the line above RTP 11:14:19 6 over UDP.</p> <p>7 Q Right. So this system architecture is 8 designed to transmit or receive data packets, right?</p> <p>9 A Well, it's using an existing network that is 10 based on data packets. 11:14:38</p> <p>11 So we had to take the data that is coming in 12 in different forms, audio and video, and convert it 13 to match what the network expects, in this case, 14 data packets.</p> <p>15 Q Okay. I want to introduce another exhibit 11:14:53 16 here. Just give me one minute.</p> <p>17 Okay, I just uploaded a new exhibit and 18 marked it as Exhibit 8.</p> <p>19 (Exhibit 8 was marked for identification 20 electronically and is attached hereto.) 11:15:27</p> <p>21 BY MR. PAK:</p> <p>22 Q Let me know when you see it.</p> <p>23 A I see it.</p> <p>24 Q Do you recognize this document?</p> <p>25 A Yes. 11:15:39</p>	11:14:19	11:14:38	11:14:53	11:15:27	11:15:39	Page 87	<p>1 BY MR. PAK:</p> <p>2 Q I want to take a look at the first paragraph 3 on the right column of page 1. After the first 4 sentence, it says:</p> <p>5 "Network latency is an 6 unavoidable fact of interaction 7 environments over the Internet."</p> <p>8 Do you see that?</p> <p>9 A Yes.</p> <p>10 Q What is network latency? 11:17:22</p> <p>11 A It's the amount of time it takes for 12 information that was sent from one side of the 13 network and how long it takes to be received at the 14 other side. It is not instantaneous and it depends 15 on distance usually. That's what we call latency. 11:17:39</p> <p>16 Q Why is network latency an unavoidable fact of 17 the interaction environments over the internet?</p> <p>18 A Because of the protocols that are in place 19 that have been created to ensure, for example, that 20 data isn't lost. Sometimes that takes longer to 11:18:04 21 make sure that it's all collected before it's 22 presented to the other side. That's one reason.</p> <p>23 The other reason is every time you go -- it's 24 not a direct connection between two distant places.</p> <p>25 You go through switches on the network. And so 11:18:22</p>	11:17:22	11:17:39	11:18:04	11:18:22	Page 89

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<p>1 switches also, as they pass the data through, 2 introduce delay in order again to avoid -- because 3 they're doing something to make sure not to lose 4 anything. So the connection of all these boxes 5 introduces some delay. 11:18:37</p> <p>6 It's not that dissimilar from an analog 7 network over long distances. Audio doesn't travel 8 at the speed of light. The longer the cable is -- 9 it has to be pretty long, but you see delays in 10 analog circuits as well. 11:18:53</p> <p>11 Q When you say "switches" on a network, are you 12 talking about packetized -- packet-based network 13 switches?</p> <p>14 A In this case we're talking about the 15 internet, so that is a packet-based system, yes. 11:19:06</p> <p>16 Q Okay. And the bottom of PDF page 1 under 17 subsection "Low Latency Audio," it says:</p> <p>18 "The challenges in transmitting 19 audio over the internet are packet 20 loss and fluctuations in transmission 11:19:24</p> <p>21 time."</p> <p>22 So, you know, is packet loss, you know, 23 inevitable in a system that communicates over the 24 internet?</p> <p>25 MR. KAPLAN: Object to form. 11:19:42</p>	<p>1 In this case, because this was an Internet2 2 experiment, we had to convert it to the UDP style -- 3 the IP-type packet based form so that we could use 4 that network.</p> <p>5 And then the opposite procedure happens at 11:21:23 6 the other end. We can't experience packets. We can 7 experience picture and sound. So we have to convert 8 it back.</p> <p>9 Q So once data is converted from analog to 10 digital and sent over the internet, that data has to 11:21:35 11 take the form of packets; is that right?</p> <p>12 A If we're going to use an internet -- existing 13 internet infrastructure, yes.</p> <p>14 Q Okay. I want to take a look at Figure 1 15 shown on PDF page 2. 11:22:02</p> <p>16 A Okay.</p> <p>17 Q And the top of Figure 1 says: 18 "Data sources produce packetized 19 realtime data streams."</p> <p>20 Do you see that? 11:22:16</p> <p>21 A Yes.</p> <p>22 Q What are the data sources in Figure 1?</p> <p>23 A All kinds of multimedia capturing devices. 24 Camera, microphones -- cameras, microphones, in this 25 case haptic sensors. 11:22:38</p>
<p>1 THE WITNESS: Inevitable? There are ways to 2 mitigate it, and trade-offs. So you could make it 3 not happen at all. If you were okay incurring more 4 latency, just wait longer for everything to arrive. 5 But that's the trade-off. So in a realtime system 11:19:59</p> <p>6 where you don't have the luxury of waiting, they are 7 inevitable in that sense, yes.</p> <p>8 BY MR. PAK:</p> <p>9 Q Okay. But when we talk about devices that 10 communicate over the internet, we're talking about 11:20:20</p> <p>11 devices that send or receive data in the form of 12 data packets, right?</p> <p>13 A Well, in that diagram, the two end devices, 14 the one at Diagram 1 we were talking about, is 15 that -- I'm sorry. That was in the previous 11:20:38</p> <p>16 example? Yes, it was. Let's see if it's here as 17 well.</p> <p>18 The devices that connect to the internet, 19 let's say the computer that connects to the internet 20 on the sending side takes in analog data from the 11:20:53</p> <p>21 real world, converts it first to digital, and then 22 it has to convert it to a form -- you know, if we're 23 doing this experiment over a different kind of 24 network, we'd have to convert to whatever that 25 network expected. 11:21:11</p>	<p>1 Q So data from these data sources are 2 first converted to digital form, right, and then 3 sent in packets over the internet; is that correct?</p> <p>4 MR. KAPLAN: Object to form.</p> <p>5 THE WITNESS: Yes. Yes. That's what those 11:23:08</p> <p>6 little rectangles are trying to indicate, that data 7 has been packetized in realtime using RTP, as it 8 says there.</p> <p>9 BY MR. PAK:</p> <p>10 Q Okay. You know, I'm going to start 11:23:26</p> <p>11 transitioning over to discussing your declaration.</p> <p>12 So why don't we take a ten-minute break.</p> <p>13 Is that okay?</p> <p>14 A Sure.</p> <p>15 THE VIDEOGRAPHER: Off the record at 11:23:34</p> <p>16 11:23 a.m.</p> <p>17 (Recess.)</p> <p>18 THE VIDEOGRAPHER: We are on the record at 19 11:36 a.m.</p> <p>20 BY MR. PAK: 11:36:18</p> <p>21 Q Dr. K., you submitted a declaration on 22 June 1, 2021, for this matter between Sonos and 23 Google, correct?</p> <p>24 A Correct.</p> <p>25 Q You were retained as an expert to offer 11:36:35</p>

<p>1 opinions on claim construction related to the 2 asserted patents in this case, right? 3 A Yes. 4 Q When were you contacted to offer your 5 opinions for claim construction related to the 11:36:46 6 asserted patents? 7 MR. KAPLAN: Object to form. 8 THE WITNESS: Specific to claim construction, 9 the discussions probably started a month ago, I'm 10 guessing. 11:37:01 11 BY MR. PAK: 12 Q So you were -- were you first contacted to 13 offer opinions on claim construction in May; is that 14 correct? 15 MR. KAPLAN: Object to form. 11:37:13 16 THE WITNESS: Again, I don't have the dates 17 in my head. It was after I was retained for the 18 case, obviously, but sounds about right. It could 19 have been in April. 20 BY MR. PAK: 11:37:26 21 Q Okay. Were you informed of what each party's 22 construction was at the time? 23 A At the time -- I was eventually, but not at 24 the time, no. 25 Q What did you do to prepare for your 11:37:45 Page 94</p>	<p>1 observation purposes. 2 BY MR. PAK: 3 Q Did you consider any other material to 4 prepare your declaration? 5 A Other than what I mentioned, no. 11:39:51 6 Q All right. I'd like to introduce your 7 declaration here now as Exhibit 9. I marked it as 8 Exhibit 9 and uploaded it. So just let me know when 9 you see it. 10 A I see it. I just wanted to ask you a 11:40:36 11 question. I have a clean copy of the -- from the 28 12 pages of the part that I wrote on my desk. 13 Sometimes it's easier to go to a page that way than 14 it is -- if that's okay with you, I have it right 15 here. It's not marked. It's just a clean printout. 11:40:49 16 (Exhibit 9 was marked for identification 17 electronically and is attached hereto.) 18 BY MR. PAK: 19 Q Yeah, that's okay. 20 Can you look at the last page of your 11:40:53 21 declaration or PDF page 28 of Exhibit 9. 22 A Yes. 23 Q Is that your signature? 24 A It's my electronic signature, yes. 25 Q I forgot to ask you, is this a true and 11:41:17 Page 94</p>
<p>1 declaration? 2 A I read the patents. I read through the 3 patent office -- office actions. Some of the prior 4 art. That's basically it. And then used knowledge, 5 my experience in the field to help form my opinions. 11:38:12 6 Q Did you consider the cited references in 7 the -- did you consider the cited references in the 8 office actions? 9 A Oh, the office actions. 10 I'm trying to remember. I read through a lot 11:38:36 11 of documents. I don't know if that -- for sure. I 12 tried to be as complete as possible. I don't know 13 if I did or not. Probably. 14 Q Do you understand that Sonos's experts, 15 Dr. Almeroth and Dr. Schmidt, submitted declarations 11:38:59 16 on claim construction in this case? 17 A Yes. 18 Q Did you read Dr. Almeroth's declaration? 19 A I did. 20 Q Did you read Dr. Schmidt's declaration? 11:39:14 21 A I believe I did. 22 MR. PAK: And, you know, just for the record, 23 I just noted Dr. Schmidt is actually on this Zoom 24 call. So I just wanted to point that out. I think 25 he joined a little bit late, but he is just here for 11:39:37 Page 95</p>	<p>1 correct -- true and accurate copy of your 2 declaration submitted June 1, 2021? 3 A Yes, it is. 4 Q Okay. And the opinions set forth in this 5 declaration are yours, correct? 11:41:32 6 A Yes. 7 Q To date, this is the only declaration that 8 you submitted in this case, correct? 9 A That's right. 10 Q Your declaration is as accurate and complete 11:41:42 11 as you could reasonably make it, correct? 12 A Yes. There's a minor copy and paste problem 13 that happened that I saw last night, but other than 14 that, yes. 15 Q Okay. And where is that copy and paste 11:42:02 16 error? 17 A It's on page 13. Claim terms. Part A is 18 zone configuration and part B should be just group 19 configuration. But initially I had them both 20 together in one table and then I split it up. So B 11:42:26 21 should be just group. That's it. 22 Q Is that the only error you see in your 23 declaration? 24 A That's all I saw, yes. 25 Q So let's walk through your declaration. 11:42:42 Page 97</p>

25 (Pages 94 - 97)

<p>1 Section 2, paragraphs 8 through 13, sets 2 forth your qualification as an expert, correct? 3 A Yes. 4 Q And Section 3, paragraphs 14 to 22, sets 5 forth your understanding of various legal standards 11:43:00 6 related to claim construction; is that fair? 7 A That's correct. 8 Q In reaching your opinions set forth in your 9 declaration, did you apply the legal standards set 10 forth in Section 3? 11:43:16 11 A Yes. To the best of my ability, I did. 12 Q Okay. Section 4, paragraphs 23 to 29, sets 13 forth your overview of the asserted patents, 14 correct? 15 A Yes. 11:43:30 16 Q Subsection A -- in subsection A, you provide 17 an overview of what you call the direct play 18 patents, correct? 19 A Yes. 20 Q According to subsection A, the direct play 11:43:50 21 patents share a common specification, correct? 22 A Yes. 23 Q At subsection B you provide an overview of 24 what you call the zone scene patents, correct? 25 A Right. 11:44:14 </p>	<p>1 this matter, correct? 2 A Right. 3 Q Section 7, paragraphs 37 all the way through 4 the end to paragraph 76, sets forth your analysis 5 regarding some of the parties' disputed claim 11:45:48 6 construction terms in this matter, correct? 7 A Yes. 8 Q And specifically paragraphs 37 to 48 provide 9 your analysis regarding the terms "zone 10 configuration" and "group configuration," correct? 11:46:02 11 A Correct. 12 Q Paragraphs 39 through 53 provide your 13 analysis regarding the term "local area network," 14 correct? 15 A 39? 11:46:18 16 Q Go ahead. Sorry. Let me repeat that. 17 Paragraphs 49 through 53 provide your 18 analysis regarding the term "local area network," 19 correct? 20 A Yes. 11:46:38 21 Q And paragraphs 54 to 59 provide your analysis 22 regarding the term of "media particular playback 23 system," correct? 24 A Yes. 25 Q Paragraph 60 to 73 provide your analysis 11:46:59 </p>
<p>Page 98</p> <p>1 Q According to this section, the zone scene 2 patents include the '206, '966, and '855 patents, 3 correct? 4 A Yes. I just want to point out these names 5 were provided to me and I believe they were -- these 11:44:31 6 are the Sonos designations. I'm not a hundred 7 percent that's -- the groupings of the patents were 8 provided this way. 9 Q When I -- if I refer to certain patents as 10 direct play patents or zone scene patents, you 11:44:46 11 understand what I mean by those terms? 12 A Yes. 13 Q Okay. 14 A I do. 15 Q According to subsection B, the '206 patent 11:44:52 16 specification is substantially the same as the '966 17 and the '855 patent specifications, correct? 18 A Yes. 19 Q Okay. Moving on to section 5, paragraphs 30 20 to 34, those paragraphs set forth your opinions 11:45:14 21 regarding the level of ordinary skill in the art, 22 correct? 23 A Correct. 24 Q Then Section 6, paragraphs 35 and 36, sets 25 forth your understanding of the asserted claims in 11:45:28 </p>	<p>Page 100</p> <p>1 regarding the term "data network," correct? 2 A Correct. 3 Q And, lastly, paragraphs 74 to 76 provide your 4 analysis regarding the term "wherein the instruction 5 comprises the instruction," correct? 11:47:18 6 A Right. 7 Q So we just walked through your declaration 8 here. Do you have any other changes besides that 9 copy and paste error that you would like to make to 10 your declaration? 11:47:33 11 A No. 12 Q So how about we jump to paragraph 24. It's 13 on page 9 of your declaration. 14 A Okay. 15 Q Okay. Paragraph 4 -- paragraph 24 says: 11:47:54 16 "Each of the zone scene patents 17 originated with U.S. provisional 18 application number 60/825,407, which 19 was filed on September 12, 2006." 20 Do you see that? 11:48:14 21 A Yes. 22 Q Now, let's take a look at paragraph 28 on the 23 next page. 24 A I see it. 25 Q Actually, if you go to the bottom of page 11, 11:48:33 </p>

<p>1 it says:</p> <p>2 "In my experience, at the time 3 the Zone Scene patents were filed, 4 multi-zone audio systems existed from 5 a variety of manufacturers, such as 11:48:45 6 Bose, Crestron, and others."</p> <p>7 Do you see that?</p> <p>8 A Yes.</p> <p>9 Q Do you know any specific conventional 10 multi-zone audio systems that existed at the time 11:48:58 11 the zone scene patents were filed?</p> <p>12 A Are you saying other than the ones I listed 13 here?</p> <p>14 Q Well, you've listed manufacturers, right?</p> <p>15 But do you know any actual product names or model 11:49:11 16 numbers?</p> <p>17 A Oh, product names. Let's see if I can recall 18 any.</p> <p>19 The Bose one I think was called a Lifestyle. 20 I'd have to look it up. 11:49:28</p> <p>21 Crestron -- Crestron makes hardware and 22 software for multi-room installations, whether it's 23 board rooms or homes. I don't know if they have a 24 specific product name. But normally there's others.</p> <p>25 A lot of the home theater receiver manufacturers, 11:49:55 Page 102</p>	<p>1 Q Could you please describe how the Bose 2 Lifestyle system operates?</p> <p>3 A It has the main -- I guess I would call it a 4 processing box where you connect your audio sources.</p> <p>5 So it acts as a source selector. That box provides 11:52:03 6 outputs that go to amplifiers in it as well and 7 provides outputs that interconnect the loudspeakers.</p> <p>8 In that case I believe it was a 5.1 surround system.</p> <p>9 And it has an additional -- I don't know what they 10 call it -- breakout box that allows you to extend to 11:52:22 11 a different room and still be controlled by the main 12 controller. And also it had a remote control.</p> <p>13 Q How do the loudspeakers interconnecting to 14 that central box communicate with the controller, 15 the remote controller? 11:52:51</p> <p>16 A The remote controller sends signals over a 17 wireless link to the main box, I guess main 18 processor. And then it tells, you know, what each 19 speaker should be playing over the wired 20 connections. 11:53:18</p> <p>21 Q Do the loudspeakers connected to the central 22 box communicate with one another?</p> <p>23 A With one another? No. The central processor 24 decides what to send to each one.</p> <p>25 Q In the Bose Lifestyle system can you 11:53:40 Page 104</p>
<p>1 such as Denon -- I know that one because that was 2 the first product that Audyssey went into when we 3 first started. It was the AVR5805, and many others 4 after that. They all provide connectors and 5 mechanism to have multiple zones of audio in your 11:50:19 6 home.</p> <p>7 Initially there was two and eventually more 8 than two, perhaps three or four. Yamaha, Marantz, 9 Onkyo, many of those had those.</p> <p>10 Q Have you ever used a Bose Lifestyle system? 11:50:40</p> <p>11 A I have, yes.</p> <p>12 Q Do you know -- do you know which Bose 13 Lifestyle system you used?</p> <p>14 A It's been so many years, so I don't remember 15 the model number. 11:51:08</p> <p>16 Q Does the Bose Lifestyle 50, does that ring a 17 bell?</p> <p>18 A Possibly, but I don't remember.</p> <p>19 Again, this was one of the situations where 20 we brought it into the testing lab at Audyssey just 11:51:25 21 to look at things. So paid less attention to the 22 model number than what it could do.</p> <p>23 Q Do you recall how the Bose Lifestyle system 24 operates?</p> <p>25 A At a high level, sure, yes. 11:51:41 Page 103</p>	<p>1 synchronize the loudspeakers to play audio in 2 synchrony?</p> <p>3 A Yes.</p> <p>4 Q How does the Bose Lifestyle accomplish that?</p> <p>5 A That's a Bose method inside their own 11:54:05 6 processor. Let's just say it wouldn't be a very 7 successful product if they played out of synchrony.</p> <p>8 It would be a terrible audio system.</p> <p>9 Q Right. But the loudspeakers don't 10 communicate with each other, right? So how do they 11:54:25 11 coordinate with one another to play audio in 12 synchrony?</p> <p>13 A Because the central processor that is 14 deciding what to send, what signal stream to send to 15 each one makes sure that they are transmitted over 11:54:38 16 each connection in the required synchrony.</p> <p>17 Q When you say "the central processor," you're 18 talking about the central device that interconnects 19 the loudspeakers, correct?</p> <p>20 A Right. That has a processor in it and it's 11:54:58 21 responsible for a number of things, simple things 22 like adjusting volume in response to commands that 23 it receives. Perhaps decoding audio formats from 24 the sources that are coming in. And then 25 distributing the audio over the interconnect. 11:55:16 Page 105</p>

27 (Pages 102 - 105)

<p>1 Q So the loudspeakers communicate with the 2 central processor, right, but they don't communicate 3 with one another directly, correct? 4 MR. KAPLAN: Object to form. 5 THE WITNESS: The loudspeakers receive data 11:55:35 6 from the central processor, but they don't 7 communicate with each other. 8 BY MR. PAK: 9 Q Okay. So what -- what cables are required to 10 interconnect the loud speakers to the central box or 11:55:57 11 the central processor of the Bose Lifestyle system? 12 A These are provided by Bose. They are copper 13 cables and they have RCA-type connections at the end 14 of each side of the cable. 15 Q Do you know if the Bose Lifestyle system can 11:56:31 16 communicate over Wi-Fi? 17 A I'm sure they have models that can. That 18 particular one I don't think did. 19 Q So the loudspeakers are internet connected to 20 the central processor or central box, right? What 11:56:59 21 is the form of data that is transmitted between the 22 loud speaker and the central processor? 23 MR. KAPLAN: Object to form. 24 THE WITNESS: It's analog audio data. 25 //</p>	<p>1 communicate over a local area network? 2 A Based on what I said this morning, that is a 3 local area network. It's analog data going to -- 4 being carried over copper wires to end devices. 5 Q Okay. And this Bose Lifestyle system was 11:59:06 6 unable to -- incapable of communicating over the 7 internet; is that right? 8 MR. KAPLAN: Object to form. 9 THE WITNESS: Because I don't remember the 10 model, I'm not sure if this -- if you could stream 11:59:35 11 to it. It could connect to a number of sources. I 12 just don't recall if one of them could be a wireless 13 source. 14 BY MR. PAK: 15 Q Do you know when you used this Bose Lifestyle 11:59:52 16 system? 17 A Probably seven or eight years ago. 18 Q So sometime in 2013, 2012 you used this Bose 19 Lifestyle system? 20 MR. KAPLAN: Object to form. 12:00:13 21 THE WITNESS: To the best of my recollection. 22 BY MR. PAK: 23 Q Do you know when this Bose Lifestyle system 24 was released? 25 MR. KAPLAN: Object to form. 12:00:23</p>
<p>Page 106</p> <p>1 BY MR. PAK: 2 Q Does it have to be analog audio data? 3 MR. KAPLAN: Object to form. 4 THE WITNESS: In general or in that product? 5 BY MR. PAK: 6 Q In that product. In that product when a 7 loudspeaker communicates to the central processor or 8 the central box, does it send analog data or digital 9 data? 10 A It sends analog data because the amplifiers 11:57:42 11 are inside that same box where the processor is. So 12 the output of the amplifier is using analog audio 13 signals sent to each speaker. 14 Q So in that product, in that Bose Lifestyle 15 system, the loudspeakers are not sending data 11:57:59 16 packets to that central processor, correct? 17 MR. KAPLAN: Object to form. 18 BY MR. PAK: 19 Q Sorry. Did you say "correct"? 20 A Yes, correct. 11:58:17 21 Q Okay. Do you know if the Bose Lifestyle 22 system communicated over a local area network? 23 A Communicated with what? 24 Q Do you know if the loudspeakers 25 interconnected to the central processor could</p>	<p>Page 108</p> <p>1 THE WITNESS: I know that their Lifestyle 2 series was released well before that. I just -- and 3 they have more than one model. So that was probably 4 current at the time when we looked at it, but I 5 don't know. 12:00:42 6 BY MR. PAK: 7 Q But this is the model of Bose Lifestyle 8 system that included a remote control, you said; is 9 that right? 10 A Yes. 12:00:50 11 Q Could you describe what this remote control 12 did in the Bose Lifestyle system? 13 A The obvious things. Selecting the source -- 14 again, this is a bit of a long time ago, but I think 15 it was change the volume and select the room. I 12:01:14 16 think they call it multi-room in the manual or in 17 the Bose language. So select which room you want 18 the music to play in or if it was all rooms. 19 That's my basic recollection. There might 20 have been other things too, but I just don't 12:01:42 21 remember. 22 Q Do you know what the Bose Lifestyle system 23 remote control looked like? Like what shape it 24 might have been in? 25 MR. KAPLAN: Object to form. 12:02:01</p>

28 (Pages 106 - 109)

1 THE WITNESS: It had a screen -- it had a 2 screen in front of it. It might have been 3 rectangular or oval. I'm stretching my memory. 4 BY MR. PAK: 5 Q I understand. I know it's 17 years ago. I 6 was just curious. 7 I want to move to paragraph 31 of your 8 declaration. It's talking about the level of 9 ordinary skill in the art. Could you please read 10 paragraph 31 of your declaration.	12:02:21 12:02:32	1 today, but basically data networks. It's -- I guess 2 in -- at least at USC, I think the -- it's an area 3 that is studied called information networks. So I 4 think it's just different terminology for data 5 networks. 12:04:42 6 Q Are you using the term "information networks" 7 to be synonymous with "data networks"? 8 A In this paragraph, yes. 9 Q So an information network is any type of 10 media that carries data, right? 12:05:00	
11 A Yes. 12 "In my opinion, a person of 13 ordinary skill in the art at this time 14 would have had a bachelor's of science 15 in electrical engineering, computer 16 science or engineering, or a related 17 field, and two to four years of work 18 or research experience in the field of 19 information networks, data 20 communications or multimedia systems, 21 or a master's degree and one to two 22 years of experience in the same 23 field." 24 Q Does that mean a person of ordinary skill in 25 the art can be someone with a master's degree in any	12:02:42 12:02:52 12:03:02 Page 110	12:05:17 12:05:33 12:05:41 12:06:01 Page 112	
1 field and one to two years of experience in the 2 fields of information networks, data communications, 3 or multimedia systems? 4 A No. What I meant is a master's degree in the 5 areas that I listed for the bachelor's. 12:03:19 6 Q Okay. So what you -- what you meant was a 7 master's degree in electrical engineering, computer 8 science, or engineering, and one to two years of 9 experience in the fields of information networks, 10 data communications, or multimedia systems; is that 11 right? 12 A Correct. 13 Q Okay. So as it is written right now in 14 paragraph 31, the way it's written is incorrect, 15 right? 12:03:47 16 MR. KAPLAN: Object to form. 17 THE WITNESS: Well, I don't know if it's 18 incorrect. I mean, I didn't want to repeat. I know 19 that's probably customary in legal documents, but I 20 thought it was obvious that it was referring to for 21 bachelor's, you get your master's in the same 22 fields. 23 BY MR. PAK: 24 Q And what are information networks? 25 A We've talked about all kinds of examples	12:03:34 12:04:02 12:04:14 Page 111	1 processing systems with processing that can handle 2 multiple types of media, such as pictures, video, 3 audio, voice, text, haptics, all the ones that we 4 talked about earlier. 5 Q What about an audio system that only renders 6 audio, is that a multimedia system? 7 A An audio system that can't handle anything 8 else? 9 Q Yes. 10 A No. I would say no. Multi in multimedia 11 requires more than one. 12 Q So if a person has a -- sorry, I didn't mean 13 to cut you off. 14 A I'm fine. I'm done. 15 Q If a person has a bachelor's of science in 16 electrical engineering and only has experience in 17 audio systems that only render audio, but not any 18 other type of media, then that person would not 19 qualify as a person of ordinary skill in the art, 20 correct? 21 A No, I don't agree. I think if somebody has 22 studied multimedia systems as part of their field of 23 study, they have also studied audio and other 24 things. So if you have taken courses in multimedia 25 systems, you certainly have taken courses in just	12:06:38 12:06:53 12:07:06 12:07:49 Page 113

<p>1 audio, similar to the ones that I teach, or just 2 speech like my colleagues teach, or just video, and 3 also the integration of them. So it comes with 4 everything.</p> <p>5 Q You know Sonos is a speaker company, right? 12:08:00</p> <p>6 A Yes.</p> <p>7 MR. KAPLAN: Object to form.</p> <p>8 BY MR. PAK:</p> <p>9 Q So if a person who works at Sonos has a 10 bachelor's of science in electrical engineering and 12:08:14 11 has experience in working on speaker systems that 12 render audio but don't render video or any other 13 type of media, does that person still qualify as a 14 person of ordinary skill in the art?</p> <p>15 A That's kind of a hypothetical question. I'd 12:08:39 16 have to meet that person and find out what their 17 experience was to really answer that. I don't know 18 what courses they took or what experience they had 19 prior to Sonos.</p> <p>20 Q What I'm trying to get at here is the word 12:08:47 21 "multimedia systems." You know, it seems like in 22 order to have experience in multimedia systems, 23 right, you need to -- you need a person that studied 24 a systems that render multiple types of media, 25 according to your definition, right? 12:09:16</p>	<p>1 times. Computer games. More boring ones like 2 PowerPoint presentations with audio or video 3 embedded in them. Anything that has more than two 4 media. Or two or more, I should say.</p> <p>5 Q Is a multimedia system that can render two or 12:11:11 6 more types of media other than audio, would that 7 qualify as a multimedia system?</p> <p>8 A Sure.</p> <p>9 Q So if a person has experience in implementing 10 and designing multimedia systems that don't render 12:11:38 11 audio but other types of media, is it your opinion 12 that that person would qualify as a person of 13 ordinary skill in the art?</p> <p>14 A I'm sorry. Could you repeat that one more 15 time? 12:11:50</p> <p>16 Q Yeah. So if a person has experience in 17 implementing or designing a multimedia system that 18 doesn't render audio but renders other types of 19 media, is it your opinion that that person would 20 qualify as a person of ordinary skill in the art? 12:12:04</p> <p>21 A My assumption -- what I was trying to say 22 here was that this person has studied multimedia 23 systems. Whether they're designing now or not is 24 different. But if they studied multimedia systems, 25 then they certainly studied audio, voice, graphics 12:12:22</p>
<p>Page 114</p> <p>1 A Right. But not just renders. All aspects -- 2 multimedia systems represent systems that deal with 3 the integration, whether it's on the capture side, 4 compression, streaming of these integrated media 5 types. 12:09:47</p> <p>6 But in order to study that, you do have to 7 study each individual one as well. This is not 8 just -- all components have to be studied 9 individually as well. And I assume somebody with 10 that kind of degree -- just based on the degrees we 12:10:00 11 have at USC, I can say that that's for sure the 12 case.</p> <p>13 Q What are -- what are some examples of 14 multimedia?</p> <p>15 MR. KAPLAN: Object to form. 12:10:15</p> <p>16 BY MR. PAK:</p> <p>17 Q Or let me phrase it differently.</p> <p>18 What types of media -- what are some examples 19 of media types that would be categorized as 20 multimedia? 12:10:28</p> <p>21 A Okay. So we're talking about media, not 22 systems, right?</p> <p>23 Q Yes.</p> <p>24 A You know, some obvious ones are television 25 programs, picture and sound, and graphics many 12:10:39</p>	<p>Page 116</p> <p>1 and text and others, perhaps, depending on the 2 program. So they've certainly had experience.</p> <p>3 Q Okay. So you're assuming that if a person 4 has experience in multimedia systems, that person 5 would have experience in other types of media, 6 whether that's video, audio, or images, that person 7 would have experience in all of those different 8 types of media, correct?</p> <p>9 A Correct. I wouldn't call them "other." I 10 would call them components of multimedia. 12:12:43</p> <p>11 Q Okay. Let's take a look at paragraph 62 of 12 your declaration.</p> <p>13 A Yes.</p> <p>14 Q Would you please read that paragraph for me, 15 just the first two sentences. 12:13:28</p> <p>16 A</p> <p>17 "Numerous technical dictionaries 18 confirm that data," in quotations, 19 "including audio data, can be 20 represented in both analog," in 12:13:37 21 quotes, "or digital," in quotes, 22 "form. Digital data is," quotes, 23 "data represented in discreet 24 discontinuous form, as contrasted with 25 analog data represented in continuous 12:13:47</p>

1 form," end quote.	1 format and can be transported or
2 Q Okay. And then paragraph -- in paragraph 63,	2 streamed over a data network."
3 the second sentence, it says:	3 Do you see that?
4 "In the generic sense, packets	4 A I do.
5 refer to the manner in which data are	5 Q The '206 patent discusses sending and
6 organized into discreet units for	6 receiving audio in digital form, correct?
7 transmission and switching through a	7 A Yes.
8 data network."	8 MR. KAPLAN: Object to form.
9 Do you see that?	9 BY MR. PAK:
10 A Yes. 12:14:12	10 Q Is there anywhere in the '206 patent that
11 Q So data packets are in digital form, correct?	11 discusses sending and receiving audio data in the
12 A Data packets are, yes.	12 form of -- let me -- let me rephrase that.
13 Q Can data packets be in analog form?	13 Is there anywhere in the '206 patent that
14 A Data can be in analog form, but it's not	14 discusses sending and receiving audio in analog
15 transmitted using packets. 12:14:37	15 form? 12:18:08
16 Q Right. So data packets are not in analog	16 A That wasn't -- I'd have to go look at it
17 form, correct?	17 again. I don't remember every word of the patent.
18 A Correct.	18 The sections that I looked at for my opinion were --
19 Q Are there other discreet discontinuous forms	19 you know, I just looked for those things. So I
20 of data that are not data packets? 12:14:53	20 would have to go look and make sure of the answer. 12:18:26
21 A Yes.	21 Q Sitting here today, you can't recall any
22 Q What are those forms of data?	22 passages in the '206 patent that discusses sending
23 A A digital audio stream that consists of bits,	23 and receiving audio data in analog form, correct?
24 those are not packets. It's continuous stream of	24 MR. KAPLAN: Object to form.
25 bits or a digital audio stream that we talked about	25 Mischaracterizes testimony. 12:18:43
Page 118	Page 120
1 before that has been modulated through some	1 THE WITNESS: Like I said, I don't want to
2 pre-agreed encoding scheme like pulse code	2 say I do or I don't because I don't -- I'd have to
3 modulation. Though those are not -- those are	3 go read it. It's possible.
4 digital streams that are not packets.	4 For example, I know that at Sonos there are
5 Q In order to stream audio from the internet,	5 Sonos audio products that have analog inputs on the
6 from an internet media source on a speaker, does	6 back. And so I just don't know if -- I just don't
7 that streaming audio have to be in the form of	7 know if there is a section in this patent since I
8 packets or can it be in a continuous form of data?	8 haven't looked for that specifically.
9 A If we're talking about the general purpose	9 BY MR. PAK:
10 internet, you know, it only supports packet	10 Q Would it help if we take a few minutes for
11 protocols. So it would have to be put in that form.	11 you to review the patent and see if you can find any
12 Q I'd like to introduce a new exhibit here. I	12 passages that discuss sending and receiving audio in
13 uploaded it and marked it as Exhibit 10.	13 the form of analog data?
14 (Exhibit 10 was marked for identification	14 A Sure.
15 electronically and is attached hereto.) 12:16:55	15 Q Okay. So how about we do that, take a few
16 BY MR. PAK:	16 minutes.
17 Q Let me know when you see that.	17 A Okay.
18 A I see it.	18 THE REPORTER: Do you want to go off the
19 Q Do you recognize this document?	19 record or not?
20 A Yes. It's the '206 patent. 12:17:06	20 MR. KAPLAN: No. 12:19:46
21 Q I want to take a look at Column 4. It's on	21 THE WITNESS: By doing a quick search, I
22 PDF page 16 and line 36. It says:	22 could find -- I could keep looking -- Column 4, line
23 "As used herein, unless	23 65:
24 explicitly stated otherwise, an audio	24 "The device 112 is configured to
25 source or audio sources are in digital	25 receive an analog audio source, e.g., 12:20:23
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1 for broadcasting."	1 and 10. Without reading them directly, it talks
2 The audio sources -- Column 5 -- I'm just	2 about the ability to handle analog signals, whether
3 reading from line 65 onward. The last line there	3 it's processing them from inputs and then converting
4 says:	4 them to digital to share with other devices on a
5 "The analog audio sources can be 12:20:45	5 network. And then line 9 on the same column: 12:23:21
6 converted to digital audio sources."	6 "The audio amplifier is typically
7 BY MR. PAK:	7 an analog circuit, but powers the
8 Q Right. And then the next sentence says:	8 provided analog audio signals to drive
9 "In accordance with the present	9 one or more speakers."
10 invention, the audio source may be 12:20:58	10 Q So those sentences that you point out, you 12:23:43
11 shared among the devices on network	11 know, on Column 6 of the patent talk about
12 108."	12 processing analog signals, but when that signal is
13 Do you see that?	13 actually sent or received over the network, it talks
14 A I do.	14 about producing digital signals. So it's talking
15 Q So let's go back to paragraph 4 -- column 4, 12:21:07	15 about converting the analog signals to digital 12:23:56
16 line 50. Could you please read that paragraph for	16 signals to communicate over the network, correct?
17 me.	17 A Yes.
18 A	18 MR. KAPLAN: Object to form.
19 "The network 108 may be a wired	19 THE WITNESS: Yes. I was just responding to
20 network, a wireless network, or a 12:21:22	20 your question as to whether there is any mention of 12:24:06
21 combination of both."	21 analog in this. Clearly the patent talks about
22 Q You can keep going.	22 products that could handle connections to analog
23 A	23 input signals.
24 "In one example, all devices,	24 BY MR. PAK:
25 including the zone players 102, 104, 12:21:32	25 Q Right. But does this patent talk about 12:24:17
Page 122	Page 124
1 and 106, are coupled to the network by	1 sending analog data over the network, such as
2 wireless means, based on an industry	2 network 108 described in the patent?
3 standard such as IEEE 802.11.	3 A I think it does indirectly. Because in line
4 "Another example --	4 50 that you read before, the network may be a wired
5 Q You can stop there. 12:21:47	5 network. It doesn't say that that needs to be 12:24:47
6 As the patent describes, network 108 is	6 digital. It could be analog.
7 talking about an internet-based network that uses	7 Q Well, you know, let's go back to Column 4,
8 industry standards such as the IEEE 802.11 standard,	8 line 36. It says:
9 correct?	9 "As used herein, unless
10 MR. KAPLAN: Objection. Mischaracterizes the 12:22:04	10 explicitly stated otherwise, when an 12:25:03
11 document.	11 audio source or audio sources are in
12 THE WITNESS: I don't -- I wouldn't call this	12 digital format, they can be
13 internet based. This just tells me how the	13 transported or streamed over a data
14 components are communicating, which is a wireless --	14 network."
15 standard 802.11 wireless. 12:22:19	15 Right? So in line -- line 50 when it says 12:25:14
16 BY MR. PAK:	16 "The network 108 may be a wired network or a
17 Q And the 802.11 standard requires data to be	17 wireless network, or a combination of both," it's
18 transmitted or received in digital format, correct?	18 talking about sending data in digital format, right?
19 A Correct.	19 Unless it's stated otherwise, you have to assume
20 Q And that data transmitted over 802.11 12:22:33	20 that you're sending or receiving data in digital 12:25:30
21 standard requires data to be transmitted and	21 format, correct?
22 received in the form of data packets, correct?	22 MR. KAPLAN: Objection. Mischaracterizes the
23 A Correct.	23 document.
24 Referring back to your analog question, I'm	24 THE WITNESS: I don't know. It's hard --
25 just seeing more sections here. Column 6, line 3 12:22:59	25 it's like the paragraph here, maybe. I'm not 12:25:45
Page 123	Page 125

1 certain about that.	1 switch telephone network and send audio data to
2 BY MR. PAK:	2 render that audio data on one of those speakers?
3 Q Sure. Let me ask you this way.	3 A Oh, yeah, absolutely. Speaker phones, right?
4 So in line 50 in Column 4, it says:	4 Q Do the patents disclose speaker phones?
5 "The network 108 may be a wired	5 A I was just giving you an example of what you 12:29:08
6 network or a wireless network or a	6 could connect. You can connect any kind of
7 combination of both."	7 transducer because what you're getting out is an
8 Right?	8 audio signal. So if you send it to a loudspeaker,
9 A Yes.	9 it will play, and the loudspeaker can be any kind of
10 Q Does that sentence mention analog?	10 form. 12:29:29
11 A No.	11 Q Does the '206 patent discuss sending or
12 Q Okay. Let's take a look at paragraph 64 of	12 receiving data over a public switch telephone
13 your declaration. So back to Exhibit 9. It's PDF	13 network?
14 page -- PDF page 23.	14 A Well, as I say, it talks about sending and
15 And in the middle of that paragraph, it says: 12:26:43	15 receiving it over networks in general and it doesn't 12:29:42
16 "These networks allowed cellular	16 exclude that, but it doesn't mention it specifically
17 devices to send and receive data, as	17 either.
18 Sonos requires, typically in the form	18 Q Is a speaker phone capable of processing and
19 of voice calls."	19 rendering audio data?
20 Do you see that? 12:26:56	20 A Yes. 12:30:03
21 A Yes.	21 Q Does the '206 patent discuss sending or
22 MR. KAPLAN: I'm sorry. Which paragraph	22 receiving audio data via RCA cables?
23 again?	23 A The discussion we had before about connecting
24 MR. PAK: Paragraph 64.	24 analog sources, and I do know that some of the Sonos
25 MR. KAPLAN: Thank you. 12:27:08	25 speakers have that in the back, but that connection 12:30:30
	Page 126 Page 128
1 THE WITNESS: I see it.	1 would typically be an RCA cable. It might also be a
2 BY MR. PAK:	2 mini jack, a 1/8th inch jack or cable.
3 Q Does the '206 patent discuss sending or	3 Q Okay. So let's look at the patent, Column 1,
4 receiving audio data over a cellular or voice	4 line 40. Would you please read that first sentence
5 network? 12:27:19	5 for me. 12:31:15
6 A Well, it discusses sending or receiving it	6 A
7 over wireless networks. So that would cover all	7 "Currently one of the systems
8 kinds of wireless networks in the broadest sense,	8 that can meet part of such demand is a
9 right? It doesn't exclude them.	9 conventional multizone audio system
10 Q Can you send data over a voice network to 12:27:41	10 that usually includes a number of 12:31:21
11 render audio on a device?	11 audio players."
12 A So because you don't have construction of	12 Q Keep going.
13 what a voice network is, claim construction around	13 A
14 voice network, I want to know what your definition	14 "Each of the audio players has
15 is of voice network so I can answer correctly. 12:28:14	15 its own amplifiers and a set of 12:31:28
16 Q Right. So earlier you said a voice network	16 speakers and typically installed in
17 would be -- like an example would be a telephony	17 one place, e.g., the room. In order
18 network, like a public switch telephone network,	18 to play an audio source at one
19 correct?	19 location, the audio source must be
20 A Correct. 12:28:28	20 provided locally or from a centralized 12:31:41
21 Q And you wouldn't send or receive audio data	21 location."
22 over a public switch telephone network, would you?	22 Q Keep going?
23 A Why not? Voice is audio data basically,	23 Q No, that's okay.
24 right? So you kind of are doing that.	24 Is there anything in this patent that
25 Q Can you have speakers connected to a public 12:28:44	25 distinguishes those type of conventional multi-audio 12:32:07
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33 (Pages 126 - 129)

<p>1 systems to what is disclosed in the patent as the 2 invention?</p> <p>3 MR. KAPLAN: Objection to form.</p> <p>4 BY MR. PAK:</p> <p>5 Q Let me put it this way. The next paragraph, 12:32:34 6 can you read the first sentence of that -- of line 7 56.</p> <p>8 A</p> <p>9 "In order to achieve playing 10 different audio sources in different 12:32:44 11 audio players, the traditional 12 multizone audio system is generally 13 either hard wired or controlled by a 14 preconfigured and preprogrammed 15 controller." 12:32:55</p> <p>16 Q Right. So the patent talks about traditional 17 multizone audio systems being either hardwired or 18 controlled by a preconfigured or preprogrammed 19 controller, and it distinguishes those traditional 20 multizone audio systems from the -- from the system 12:33:13 21 disclosed in the '206 patent as the invention, 22 right?</p> <p>23 MR. KAPLAN: Object to the form.</p> <p>24 THE WITNESS: I mean, that's kind of the 25 purpose of writing the background. What you're 12:33:49</p>	<p>1 network interface functions by a wired 2 means, for example, an Ethernet 3 cable."</p> <p>4 Do you see that?</p> <p>5 A Yes. 12:35:46</p> <p>6 Q So the patent discloses that the wired 7 network can be an Ethernet cable, right?</p> <p>8 A That's a different network than the one that 9 connects -- this is not for connecting sources.</p> <p>10 This is for connecting speakers together to -- could 12:36:07 11 be wired or wireless. The previous discussion was 12 about what kind of sources.</p> <p>13 Q Right. So this is talking about the wired 14 interface of a zone player, correct?</p> <p>15 MR. KAPLAN: Object to form. 12:36:36</p> <p>16 THE WITNESS: Yes. This is talking about how 17 to connect multiple zone players, in this case, 18 speakers, whether they're wired or wireless. They 19 provide capability for both.</p> <p>20 BY MR. PAK: 12:36:54</p> <p>21 Q So let's talk about the zone player. So the 22 zone player has network interface -- so a zone 23 player has a network interface 202, which may 24 include one or both of the wireless interface 216 25 and a wired interface 217, right? 12:37:17</p>
<p>1 going to say after that is supposed to be better.</p> <p>2 BY MR. PAK:</p> <p>3 Q Right. So the disclosed system in the '206 4 patent that's described as the invention isn't 5 talking about these hardwired traditional multi-zone 12:34:07 6 audio systems, right?</p> <p>7 MR. KAPLAN: Object to form.</p> <p>8 THE WITNESS: Well, it doesn't completely go 9 away from it because it allows for a wired source, 10 an analog wired source to be connected to one of the 12:34:31 11 zone players and then be distributed. So it doesn't 12 completely remove them.</p> <p>13 BY MR. PAK:</p> <p>14 Q Does the patent discuss what the wired source 15 has to be, what form it has to be in? 12:34:49</p> <p>16 MR. KAPLAN: Object to form.</p> <p>17 THE WITNESS: It gives examples at the bottom 18 of Column 4, line 66, broadcasting, which is analog, 19 compact disk, which could be digital or analog, 20 depending on what connection you have. Yeah, those 12:35:20 21 are examples.</p> <p>22 BY MR. PAK:</p> <p>23 Q All right. So let's take a look at Column 5. 24 And I'm looking at line 33. It says:</p> <p>25 "The wired interface 217 provides 12:35:39</p>	<p>1 A Yes.</p> <p>2 Q Okay. And specifically the wired interface 3 217 provides network interface function by wired 4 means, for example, an Ethernet cable, correct?</p> <p>5 A Correct. And this is why I was talking about 12:37:39 6 the introduction before. It seems to contradict the 7 benefit because they say that the old systems were 8 all wired and so they're no good. But now they also 9 provide capability for wired. So it's just a 10 different type of wire, I suppose. 12:37:55</p> <p>11 Q As you recall, did these traditional 12 multizone audio systems include speakers that were 13 connected via an Ethernet cable?</p> <p>14 A No. That's what I'm saying. They were 15 connected by copper RCA cables or speaker cables 12:38:16 16 directly.</p> <p>17 So this is a different kind of cable, but 18 still the possibility existed of speakers in 19 different zones or rooms that are connected by 20 wires. Just a different kind of wire. 12:38:31</p> <p>21 Q What is the difference between an Ethernet 22 cable and a copper wire such as an RCA cable?</p> <p>23 A I guess Ethernet cables are also made of 24 copper, but they have different kinds of endings and 25 they have multiple strands in them carrying data. 12:39:06</p>

<p>1 So I guess I would consider an Ethernet cable 2 capable of carrying digital packet data, whereas an 3 audio interconnect carries analog audio data. 4 Q So an RCA cable carries analog data, whereas 5 an Ethernet cable carries digital data packets, 12:39:38 6 correct? 7 A To be totally clear, analog cables -- sorry, 8 RCA cables can also carry digital data. Just not 9 packetized. 10 Q Okay, that makes sense. 12:39:54 11 I want to take a look at paragraph 66 of your 12 declaration. 13 A Yes. 14 Q Let me get to it real quick. The second 15 sentence of paragraph 66 says: 12:40:21 16 "There are many types of networks 17 that do not require a network device 18 to both send and receive data from 19 another device. For example, networks 20 may be configured in a ring such that 12:40:31 21 no device both sends and receives data 22 directly to and from another device." 23 Do you see that? 24 A Yes. 25 Q Okay. So let's take a look at Sonos's 12:40:43 Page 134</p>	<p>1 directly to and from another device, correct? 2 MR. KAPLAN: Object to form. 3 THE WITNESS: I don't know how else to 4 interpret this. It says, "sending and receiving 5 from each other." So unless there is something in 12:42:10 6 between that is not disclosed, what else could it 7 be, right? 8 BY MR. PAK: 9 Q Right. So Sonos's construction of the data 10 network is broad enough to cover directly or 12:42:19 11 indirectly sending and receiving data, correct? 12 MR. KAPLAN: Object to form. 13 THE WITNESS: Right, that's true. But my 14 construction, though, was not really focused around 15 the directly part. It was that a data network, as 12:42:43 16 we've already discussed since this morning, doesn't 17 have to be digital packets. 18 BY MR. PAK: 19 Q Right. But let's look at paragraph 66 again. 20 And it says: 12:43:00 21 "For example, networks may be 22 configured in a ring such that no 23 device both sends and receives data 24 directly to and from another device." 25 Right? But Sonos's construction doesn't say 12:43:11 Page 136</p>
<p>1 proposed construction on page 21 of your 2 declaration. Could you please read Sonos's 3 construction for data network. 4 A 5 "A medium that interconnects the 12:41:00 6 devices enabling them to send data 7 packets to" -- 8 I'll start over. 9 "A medium that interconnects 10 devices, enabling them to send digital 12:41:09 11 data packets to and receive digital 12 data packets from each other." 13 Q Does Sonos's proposed construction of data 14 network require sending and receiving data directly 15 to and from another device? 12:41:26 16 MR. KAPLAN: Object to form. 17 THE WITNESS: I guess I'm not sure what 18 "directly" means in this context. We're connecting 19 two devices. 20 BY MR. PAK: 12:41:45 21 Q So let me ask you this way. Does the word 22 "directly" appear in Sonos's proposed construction? 23 A It does not. 24 Q Okay. So Sonos's construction of data 25 network does not require sending and receiving data 12:41:56 Page 135</p>	<p>1 or doesn't require direct -- directly sending and 2 receiving data, right? 3 MR. KAPLAN: Object to form. 4 THE WITNESS: The intent of this sentence 5 that I wrote here was that "directly" is kind of a 12:43:38 6 substitution for each other. Because obviously in a 7 network, in a ring network, devices are sending data 8 and they're receiving data. But it's not a send and 9 receive between two devices. And that's what I 10 meant by "directly" here. I didn't imply there was 12:43:54 11 nothing in between. 12 BY MR. PAK: 13 Q So -- sorry. 14 A No, no. 15 Q So in that -- so if a network is configured 12:44:03 16 in a ring, you'd agree with me that a device can 17 both send and receive data to and from each other? 18 A No. Because to and from each other means you 19 have two devices and they're talking back and forth. 20 And in a ring network, one device will send to the 12:44:27 21 next. If it has the token, it will -- let's say 22 it's clockwise orientation and it will send to the 23 next one and receive from the one before it. So 24 it's sending and receiving two different devices, 25 not a two-way communication. 12:44:50 Page 137</p>

<p>1 Q What is a token ring network?</p> <p>2 A It's a set of devices connected in a network</p> <p>3 that is -- as I described, think of a circle with</p> <p>4 multiple points in it. Each of those is a network</p> <p>5 device. The protocol is such that to avoid what</p> <p>6 network people call collisions, which is when a</p> <p>7 bunch of data tries to arrive at the same time, to</p> <p>8 avoid that they use traffic police kind of system</p> <p>9 where you can't talk unless you've been told to talk</p> <p>10 because you have the token. And so data goes around</p> <p>11 in circles. It can be clockwise. It can be</p> <p>12 counterclockwise. And sometimes it's a star</p> <p>13 configuration where there's a -- literally a central</p> <p>14 node and everybody communicates through, or</p> <p>15 sometimes it's a controller. So it's a different</p> <p>16 configuration for a network topology.</p> <p>17 Q I'd like to introduce a new exhibit here. I</p> <p>18 uploaded a new exhibit marked as Exhibit 11.</p> <p>19 Do you see that?</p> <p>20 A Yes. I'm waiting for it to open. I see it.</p> <p>21 (Exhibit 11 was marked for identification</p> <p>22 electronically and is attached hereto.)</p> <p>23 BY MR. PAK:</p> <p>24 Q Do you recognize this document?</p> <p>25 A Yes.</p>	12:45:12	12:45:36	12:45:51	12:46:21	12:46:33
<p>Page 138</p> <p>1 Q This was attached as Appendix L to</p> <p>2 Dr. Schmidt's declaration, and you reviewed this</p> <p>3 document, right?</p> <p>4 A I did, yes.</p> <p>5 Q I want to take a look at the last page, PDF</p> <p>6 page 6.</p> <p>7 Do you see the token ring network</p> <p>8 configuration at the bottom left?</p> <p>9 A I see it.</p> <p>10 Q So in this token ring network configuration,</p> <p>11 can a given device send data to or receive data from</p> <p>12 another device?</p> <p>13 A Yes, but not from the same device in both</p> <p>14 directions.</p> <p>15 Q Okay. And in the last sentence below that</p> <p>16 configuration, it says:</p> <p>17 "Any PC can grab a passing token</p> <p>18 and attach data and the address of</p> <p>19 another PC to it, as each PC in turn</p> <p>20 watches for tokens that are addressed</p> <p>21 to it."</p> <p>22 Right?</p> <p>23 A Yes.</p> <p>24 Q So you're saying in this configuration --</p> <p>25 let's pick one example. There's five PCs, right?</p>	12:46:42	12:46:56	12:47:17	12:47:41	12:48:10

<p>1 MR. KAPLAN: 157 for me is the '907 patent. 2 THE WITNESS: Oh, I had 57. Okay. 3 BY MR. PAK: 4 Q There's a little scroll controls you can -- 5 A Yeah. 12:52:13 6 Q Yeah. 7 A Okay. I see it. 8 Q Okay. And this is a copy of the '907 patent 9 provided as an exhibit to your declaration, right? 10 A Yes. 12:52:36 11 Q Okay. And I want to go down to PDF page 165. 12 And I want to focus on the background section of the 13 '907 patent. 14 A Okay. 15 Q Okay. And the first paragraph of the 12:52:58 16 background section says: 17 "Conventional computer networks 18 are bidirectional, allowing data 19 communication in both directions 20 between servers and clients. 12:53:08 21 Transmitting data over these 22 bidirectional data networks has been a 23 mainstay of computer technology for 24 many years and the communication 25 protocols are well established." 12:53:20 Page 142 </p>	<p>1 BY MR. PAK: 2 Q Okay. Let's take a look at Column 3, the 3 second paragraph. It says: 4 "The bidirectional data network 5 28 represents various types of 12:54:33 6 networks, including the internet, a 7 LAN, local area network, a WAN, wide 8 area network, and the like." 9 Do you see that? 10 A I do. 12:54:46 11 Q In the next paragraph it says: 12 "The broadcast center 26 receives 13 the data served from the content 14 servers 22(I) through 22(K) over the 15 network 28, and broadcasts the data 12:55:02 16 over a broadcast network 30 to the 17 clients 24(I) through 24(M)." 12:55:15 18 Do you see that? 19 A I do. 20 Q Now, if you look at Figure 1 of the '907 21 patent, and it's PDF page 158, you see there's a 22 separate bidirectional data network 28 and a 23 broadcast network 30, right? 24 A 28 and 30, yes, I see it. 25 Q So you'd agree with me that the bidirectional 12:55:45 Page 144 </p>
<p>1 Do you see that? 2 A Yes. 3 Q All right. And the third paragraph in the 4 background section, could you actually read that 5 paragraph for me. 12:53:31 6 A 7 "Apart from the classic 8 bidirectional data networks, there is 9 an increasing interest in the use of 10 broadcast or multicast networks to 12:53:40 11 deliver computer data and other 12 content to clients. These types of 13 distribution networks are 14 unidirectional in that data flows from 15 the server to the clients, but no 12:53:50 16 return communication is possible over 17 the same communication path." 18 More? 19 Q That's okay. 20 So the '907 patent actually distinguishes the 12:54:03 21 classic bidirectional data network from a 22 unidirectional broadcast or multicast network, 23 correct? 24 A Yes. 25 MR. KAPLAN: Object to form. 12:54:17 Page 143 </p>	<p>1 data network 28 and broadcast network 30 in the '907 2 patent are different networks, right? 3 MR. KAPLAN: Object to form. 4 THE WITNESS: That's what is shown in this 5 diagram. They're showing an example that has both 12:56:11 6 in there. 7 BY MR. PAK: 8 Q As shown in Figure 1, you'd agree that data 9 network 28 is bidirectional, whereas the broadcast 10 network 30 is unidirectional, correct? 12:56:24 11 A Yes, that's what is being disclosed. 12 Q Is there anywhere in the '907 patent that 13 mentions that broadcast network 30 is a data 14 network? 15 MR. KAPLAN: Object to form. 12:56:43 16 BY MR. PAK: 17 Q And we can take a minute if you need a minute 18 to review the patent. 19 A Yeah, let me take a minute. 20 So Column 3, line -- the paragraph that 12:57:30 21 starts at line 33, it says: 22 "The broadcast network 30 can be 23 implemented in a variety of ways. For 24 instance, the broadcast network might 25 be implemented as a wireless network 12:57:55 Page 145 </p>

<p>1 configured for one-way transmission, 2 i.e., satellite, radio, microwave 3 et cetera. The broadcast network 4 might also be a network that supports 5 two-way communication, but is 12:58:08 6 predominantly used for unidirectional 7 multicasting from the broadcast center 8 26 to many clients simultaneously."</p> <p>9 Q So in that sentence, does the patent use the 10 word "data network"? 12:58:29</p> <p>11 A Well, as we've said before several times, 12 wireless networks that transmit data are data 13 networks. And so it doesn't say data network when 14 it talks about ATM or Ethernet or anything else. 15 These are all data networks. 12:58:54</p> <p>16 Q Why does the patent use the term "data 17 network" when it describes data network 28, but 18 doesn't use the term "data network" when it talks 19 about broadcast network 30?</p> <p>20 MR. KAPLAN: Object to form. 12:59:09</p> <p>21 THE WITNESS: I don't know what they had in 22 mind in their language to write it that way, but -- 23 I don't know. I can't answer why they said it that 24 way. 25 ////</p>	<p>1 Q Sure. Take a minute if you need a minute to 2 review. 3 A I think it goes back to Column 3, the 4 paragraph that I was reading before, line 33 -- 5 actually, line 36 where it gives examples. 01:00:59 6 Satellite, radio, and microwave. What we talked 7 about before, satellite may or may not be data. But 8 radio and microwave is -- may not be data packet, 9 but radio and microwave are most likely not packet 10 based. So it's certainly possible the way they 01:01:25 11 wrote it. 12 BY MR. PAK: 13 Q Let's take a look at the figures here. And I 14 want to take a look at Figure 4. Let me see if I 15 can find the description for it. 01:01:58 16 Actually, let's take a look at Column 5, line 17 35. The paragraph says: 18 "Figure 4 shows exemplary steps 19 in a method for serving data packets 20 over the unidirectional network." 01:02:21 21 Do you see that? 22 A Yes. 23 Q So Figure 4 is describing a method specific 24 to transmitting data packets over broadcast network 25 30, right? 01:02:35</p>
<p>1 BY MR. PAK: 2 Q Let's look at Column 4 of the '907 patent. 3 If you look at line 22 -- 4 A Yes. 5 Q It says: 12:59:45 6 "The packet encoder 52 7 encapsulates packets of data with 8 appropriate headers for transmission 9 over the data network and broadcast 10 network." 12:59:57</p> <p>11 Do you see that? 12 A Yes. 13 Q So this patent discloses that the 14 bidirectional data network 28 and the broadcast 15 network 30 both transmit data in the form of data 01:00:12 16 packets, right? 17 A I can indirectly assume that based on this 18 sentence. 19 Q Do you see any disclosure in the '907 patent 20 where data that is transmitted over the data network 01:00:33 21 or the broadcast network is not in the form of data 22 packets? 23 MR. KAPLAN: If you need to review the 24 patent, you can. 25 BY MR. PAK:</p>	<p>1 MR. KAPLAN: Object to form. 2 THE WITNESS: It's describing a method, but 3 not all the methods, right? Because we talked about 4 other possibilities. In this paragraph it's a 5 method, yes. 01:02:47</p> <p>6 BY MR. PAK: 7 Q And then Column 6, line 15, it says: 8 "Figure 5 shows the byte-wise 9 technique for generating a redundancy 10 packet from multiple data packets 01:03:25 11 within a redundancy group." 12 Do you see that? 13 A I'm sorry. I heard it, but I missed which 14 paragraph we're in. 15 Q Column 6, line 15. 01:03:37 16 A Yes, I see it. 17 Q So Column 5 again is describing a certain 18 technique for generating packets, right? Data 19 packets? 20 MR. KAPLAN: Object to form. 01:03:54 21 Do you mean Figure 5? 22 BY MR. PAK: 23 Q Yeah, I'm sorry. Let me rephrase. 24 Figure 5 is illustrating a specific technique 25 for generating data in the form of data packets, 01:04:09 Page 147 Page 149</p>

<p>1 right?</p> <p>2 A In this paragraph it's talking about a 3 specific aspect of it, aspect of the redundancy 4 formatter, I think is what they're talking about 5 here. 01:04:35</p> <p>6 Q Right. But, generally speaking, Figure 5 is 7 talking about data packets, correct? It's talking 8 about data in the form of data packets.</p> <p>9 MR. KAPLAN: Object to form.</p> <p>10 THE WITNESS: It is. I'm just looking a 01:04:50 11 little further down where it says it's illustrative 12 for example purposes. "Other computations may be 13 used" -- this is line 30 of the same column.</p> <p>14 So there are examples that involve packets, I 15 agree with that. But they're also saying there are 01:05:20 16 other ways.</p> <p>17 BY MR. PAK:</p> <p>18 Q Okay. And then Column 7, second paragraph, 19 it says:</p> <p>20 "Figure 6 shows an exemplary data 01:05:31 21 structure 110 for data packet formed 22 by packet encoder 52 and redundancy 23 formatter 54."</p> <p>24 Do you see that?</p> <p>25 A I see it. 01:05:42</p>	<p>1 possible coexistence.</p> <p>2 So, no, I don't see any figure -- the figures 3 are focusing on byte patterns and headers and packet 4 related stuff. But, again, this was not my purpose 5 for quoting this patent. 01:07:24</p> <p>6 MR. PAK: Okay. I want to transition away 7 from discussing data networks and talk about some of 8 the other terms in your declaration. Do you want to 9 take another break or just power through it?</p> <p>10 Why don't we take a break and come back in 01:07:47 11 ten minutes. Is that okay?</p> <p>12 THE VIDEOGRAPHER: Does anybody need more 13 time than that?</p> <p>14 We can go off the record. We're off the 15 record at 1:07 p.m. 01:07:55</p> <p>16 (Lunch recess.)</p> <p>17 THE VIDEOGRAPHER: We are on the record at 18 1:43 p.m.</p> <p>19 BY MR. PAK:</p> <p>20 Q So far we talked about various examples of 01:43:32 21 data networks and local area networks. And I just 22 want to run by one more example with you to further 23 understand what local area network means to a person 24 of ordinary skill in the art.</p> <p>25 So the question here is, if -- if someone 01:43:49</p>
<p>Page 150</p> <p>1 Q So we have Figure 4 is also talking about 2 data packets, right?</p> <p>3 A Figure 6, you mean?</p> <p>4 Q I'm sorry. So Figure 6 is also talking about 5 data packets, right? 01:06:02</p> <p>6 A Yes, it is. It's showing the structure. If 7 you have data packets, this is what they should look 8 like.</p> <p>9 Q And the top of column 8, it says:</p> <p>10 "Figure 7 shows exemplary steps 01:06:12 11 in a method for receiving data packets 12 transmitted over a unidirectional 13 network."</p> <p>14 Do you see that?</p> <p>15 A Yes. 01:06:20</p> <p>16 Q So Figure 7 is talking about data packets, 17 correct?</p> <p>18 A Yes.</p> <p>19 Q So are there any figures in the '907 20 patent -- in the '907 patent that doesn't talk about 01:06:32 21 data packets?</p> <p>22 MR. KAPLAN: Object to form.</p> <p>23 THE WITNESS: My reference to this patent was 24 not to address the data packet or not issue. It was 25 to address unidirectional and bidirectional and 01:06:55</p>	<p>Page 152</p> <p>1 used two cups on a string to communicate with 2 another person, does that amount to communicating 3 over a local area network?</p> <p>4 A I thought we covered this in the morning.</p> <p>5 Q Yeah, we -- 01:44:01</p> <p>6 A I think we talked about it --</p> <p>7 Q Yeah, in the context of data network, but we 8 haven't talked about it in the context of a local 9 area network.</p> <p>10 A I mean, honestly, don't take it personally. 01:44:10</p> <p>11 It's a little bit of a silly example, over a string, 12 but I guess if we -- if we use the definition that a 13 person would use for networks, this is taking 14 acoustic data and converting it to mechanical form 15 and then -- to transmit, and then converting it back 01:44:40 16 to acoustical at the other end. So in that sense, 17 it is a data network.</p> <p>18 The criteria I use for whether it's a local 19 area network is you have to have something to 20 compare it to. So stretching the string out to a 01:45:00 21 much larger area would produce a wider area string 22 network, and this would be a local area network. So 23 I think all those definitions are consistent.</p> <p>24 Q So communicating using a string, two cups on 25 a string, would amount to a local area network in 01:45:28</p>

<p>1 your opinion?</p> <p>2 MR. KAPLAN: Objection. Mischaracterizes</p> <p>3 testimony. Asked and answered.</p> <p>4 THE WITNESS: Local -- the word "local" only</p> <p>5 makes sense if there's something else to compare it 01:45:43</p> <p>6 to that is bigger or smaller.</p> <p>7 And so, as I say, if there's a larger</p> <p>8 distance with bigger string, that would be a wide</p> <p>9 area network on a string and then this would be</p> <p>10 called local if it was a smaller one. But by 01:45:58</p> <p>11 itself, it's hard to say because you need a</p> <p>12 comparison.</p> <p>13 BY MR. PAK:</p> <p>14 Q Right. So depending on the length of the</p> <p>15 string that connects the two cups, right, someone 01:46:08</p> <p>16 that uses two cups on a string to communicate with</p> <p>17 another person, that would amount to communicating</p> <p>18 over a local area network, correct?</p> <p>19 MR. KAPLAN: Same objections.</p> <p>20 THE WITNESS: Well, I guess same answer. It 01:46:24</p> <p>21 depends. There's no -- there's no length of the</p> <p>22 string that would be -- there's no size of the -- of</p> <p>23 an actual LAN that we can say if you go past this,</p> <p>24 you're no longer local area. It's -- as we saw,</p> <p>25 LANs cover from a building to a hotel to a campus to 01:46:44</p>	<p>1 does not resolve the debate relating</p> <p>2 to the use of the term 'particular.'"</p> <p>3 Q Okay. So I want to take a look at the</p> <p>4 prosecution history of the 615 patent. And just</p> <p>5 give me a minute to introduce the exhibit. 01:48:18</p> <p>6 Okay. So I've just uploaded here an exhibit</p> <p>7 marked as Exhibit 12.</p> <p>8 Do you see that?</p> <p>9 A Yes.</p> <p>10 (Exhibit 12 was marked for identification</p> <p>11 electronically and is attached hereto.)</p> <p>12 BY MR. PAK:</p> <p>13 Q Do you recognize this document?</p> <p>14 A Yes.</p> <p>15 Q Okay. So this is Appendix N of Dr. Schmidt's 01:48:56</p> <p>16 declaration, right?</p> <p>17 A Yes.</p> <p>18 Q You know, before we get into his response,</p> <p>19 you know, just generally speaking, why do you think</p> <p>20 an applicant would amend its claims during 01:49:14</p> <p>21 prosecution?</p> <p>22 MR. KAPLAN: Object to form.</p> <p>23 THE WITNESS: This sounds like a legal</p> <p>24 question to me.</p> <p>25 I don't know. Because of an error, because 01:49:40</p>
<p>Page 154</p> <p>1 a wide area complex.</p> <p>2 Same for this. It's a local area network</p> <p>3 compared to something that is a longer distance, for</p> <p>4 example, but I can't give you a number.</p> <p>5 BY MR. PAK: 01:47:03</p> <p>6 Q Sure. But if the string is -- so you're</p> <p>7 saying that depending on the length of the string,</p> <p>8 communicating using two cups attached to that string</p> <p>9 can either be a local area network or a wide area</p> <p>10 network then, correct? 01:47:18</p> <p>11 A Yeah, sure.</p> <p>12 Q Okay. So I want to go on to talk about the</p> <p>13 media particular playback system term. And if you</p> <p>14 take a look at paragraph 58 of your declaration. So</p> <p>15 we're going back to Exhibit 9. 01:47:39</p> <p>16 A Yes.</p> <p>17 Q Would you please read paragraph 58 for the</p> <p>18 record.</p> <p>19 A Yes.</p> <p>20 "I disagree with Dr. Schmidt that 01:47:51</p> <p>21 a POSITA would understand the media</p> <p>22 particular playback system of Claims</p> <p>23 3, 15 or 26 to mean media playback</p> <p>24 system. I have reviewed the</p> <p>25 prosecution history, but find that it 01:48:04</p>	<p>Page 156</p> <p>1 of additional facts, a response to the examiner.</p> <p>2 Those are some reasons I can think of.</p> <p>3 BY MR. PAK:</p> <p>4 Q Can you think of any other reasons why an</p> <p>5 applicant would amend its claims during prosecution? 01:49:57</p> <p>6 MR. KAPLAN: Object to form.</p> <p>7 THE WITNESS: No.</p> <p>8 BY MR. PAK:</p> <p>9 Q Well, look at this office action response.</p> <p>10 Do you think the applicant here amended its 01:50:21</p> <p>11 claims to overcome the cited references?</p> <p>12 A It's hard for me to speak on behalf of the</p> <p>13 applicant, the reasons that they had. I can only</p> <p>14 speak as to, you know, what I see written here.</p> <p>15 Is there a specific section you want me to 01:50:51</p> <p>16 look at?</p> <p>17 Q Yeah, so how about we take a look at the</p> <p>18 remarks on PDF page 15.</p> <p>19 A Okay.</p> <p>20 Q All right. Again, the summary of the office 01:51:10</p> <p>21 action, it says:</p> <p>22 "In the non-final office action</p> <p>23 mailed July 15, 2016, the examiner</p> <p>24 rejected Claims 1, 6 through 10, 15</p> <p>25 through 19, and 21 through 29 under 01:51:22</p>

1 pre-AIA 35 U.S.C. Section 1038, as 2 being allegedly unpatentable over 3 DaCosta in view of Dua." 4 Do you see that? 5 A I see it. 01:51:39 6 Q And there are some other, you know, 103 7 rejections with respect to Claims 3, 12 and 20, 8 correct? 9 A Yes. 10 Q Okay. And then looking at Section 3, the 11 response to the 103 rejections, the second sentence 12 says: 13 "For at least the reason that 14 cited references do not teach the 15 subject matter currently recited by 16 applicant's claims, the pending 103 17 rejections should be withdrawn." 18 Do you see that? 19 A I see it. 20 Q Okay. And let's take a look at Claim 1 on 21 PDF page -- PDF page 3. 22 Do you see that the applicant amended 23 Claim 1, right? 24 A Is this the paragraph numbered 2? 25 Q I'm taking -- I'm looking at the amendments Page 158	1 A I do. 2 Q Okay. And this is one of the patent 3 publications that was cited in the non-final office 4 action mailed July 25th, 2016. Correct? 5 A Yes. 01:55:06 6 Q Okay. And you reviewed this reference, 7 right? 8 A As I said, I read through it but mostly 9 looked at the comments. So I didn't review it in 10 the same way that I would review an actual patent in 01:55:21 11 this case, but I -- I'm familiar with it. 12 Q Sure, that's fair. 13 I want to take a look at paragraph 57, so on 14 PDF page 24. Would you please read the second 15 sentence in paragraph 57. 01:55:47 16 A The second sentence? 17 Q Yes. 18 A Okay. 19 "The term 'media player' 20 generally refers to electronic devices 01:56:04 21 that are capable of processing media 22 such as audio, video, images, 23 presentations, animation, and internet 24 content, for example, cellular phones, personal digital assistants (PDAs), 01:56:17 Page 160
1 to the claims on PDF page 3. 2 A Oh, sorry, 3. 3 I see it, yes. 4 Q Do you think the applicant here amended 5 Claim 1 to overcome the cited references? 6 A So I probably looked through the cited 7 references, but I don't have them at the tip of my 8 tongue at the moment to be able to answer that 9 accurately. 10 Q Okay. Did you review any of the cited 11 references? 12 A I read through them. I wouldn't say that I 13 reviewed them in the same way that I reviewed the 14 patents. 15 Q Okay. So, again, I want to -- how about I 16 introduce one of the cited references and discuss 17 that. Just give me a minute. 18 I just uploaded an exhibit and marked it as 19 Exhibit 13. 20 Do you see that? 01:54:24 21 A Yes. 22 (Exhibit 13 was marked for identification 23 electronically and is attached hereto.) 24 BY MR. PAK: 25 Q Do you recognize this document?. 01:54:35 Page 159	1 music players, game players, video 2 players, cameras and the like." 3 Q Okay. And I want to skip to paragraph 142 4 now. It's on PDF page 32. 5 A Yes. 01:56:41 6 Q Would you please read that first sentence on 7 paragraph 142. 8 A Yes. 9 "Finally, the device's media 10 processing capabilities 461 are listed 01:56:47 11 in the RFID transmission data 450. 12 This is" -- 13 Q Actually, please keep going. Read the second 14 sentence. 15 A 01:56:58 16 "This information indicates the 17 device's ability to process media 18 assets that are in specific formats." 19 Q Okay. And the patent further discusses some 20 example media formats, correct? 01:57:11 21 A Correct. 22 MR. KAPLAN: Object to form. 23 THE WITNESS: It does. 24 BY MR. PAK: 25 Q And looking at paragraph 143, could you 01:57:18 Page 161

1 please read the first sentence.	1 THE WITNESS: Well, under audio, they list
2 A	2 specific formats for that audio, but not all
3 "This type of information allows	3 possible. So I think "any" might be too broad
4 media player 100 to only transmit	4 because they don't list -- it's hard to say.
5 media assets which are supported by	5 BY MR. PAK: 02:00:11
6 the target devices."	6 Q All right. But Dua discloses a media player
7 Q Would you please read the second sentence in	7 that can play different types of multimedia, right?
8 full.	8 A Right, different types of audio, different
9 A Oh, sure.	9 types of video, and graphics.
10 "This information also 01:57:38	10 Q Okay. So now let's go back to the office 02:00:32
11 allows either or both of the target	11 action response, Exhibit 12.
12 device and media player 100 to convert	12 And I want to take a look at Claim 3. And
13 media assets into supported formats	13 it's on PDF page 4.
14 before transmission to the other when	14 Do you see that?
15 required." 01:57:59	15 A Yes. 02:00:59
16 Q Okay. So based on, you know, these -- this	16 Q What amendments did the applicant make to
17 disclosure that we -- that I just had you read, do	17 Claim 3?
18 you agree that Dua disclosed a media player that can	18 MR. KAPLAN: Object to form.
19 play particular media formats?	19 THE WITNESS: I'm sorry, Claim 3, PDF page 4
20 A Yes. 01:58:20	20 starts -- is a half paragraph. No, no, sorry. 02:01:15
21 Q Do you agree that Dua disclosed a media	21 BY MR. PAK:
22 player that can play particular types of media?	22 Q Yeah, so Claim 3, you know, starts from PDF
23 A They disclosed a --	23 page 4 and ends at PDF page 5, right?
24 MR. KAPLAN: Object to form.	24 A Yes.
25 THE WITNESS: They disclosed a -- the ability 01:58:33	25 Q Okay. So what -- so looking at the 02:01:33
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1 to play back multiple different types of media.	1 amendments to Claim 3, could you please walk through
2 I think that's what you're asking, yes?	2 all the amendments the applicant made in this office
3 BY MR. PAK:	3 action response.
4 Q Right. So just to clarify, so does -- do you	4 MR. KAPLAN: Objection. The document speaks
5 agree Dua discloses a media player that can play 01:58:48	5 for itself. 02:01:50
6 particular types of media?	6 THE WITNESS: I assume it's the underlined
7 MR. KAPLAN: Object to form.	7 words of the amendment.
8 THE WITNESS: I guess I'm trying to	8 BY MR. PAK:
9 understand how you're using the word "particular"	9 Q Yeah. So, you know, I'm not trying to trick
10 here. 01:59:13	10 you here. So the underlined -- the underlined words 02:01:59
11 It's -- they list a number of media by	11 represent words that were added.
12 example, but it's not clear to me that they're	12 A Okay.
13 excluding others. So I'm not sure how to answer	13 Q And the strike -- and the strike through
14 that.	14 represents terms, phrases that were deleted.
15 BY MR. PAK: 01:59:27	15 So I really just want, you know, to go over 02:02:14
16 Q Yeah, so let me reword this.	16 all the amendments. You know, can you walk through
17 Does Dua disclose a media player that can	17 what amendments were made.
18 play audio?	18 A Sure. So they added the word "particular" in
19 A Yes.	19 several places. "Particular playback device."
20 Q Does Dua disclose a media player that can 01:59:39	20 "Media particular playback system." 02:02:36
21 play video?	21 And then "wherin the first zone includes the
22 A Yes.	22 particular playback device."
23 Q So Dua discloses a media player that can play	23 So all the additions have to do with
24 any particular type of media, right?	24 "particular" except for the last one that they
25 MR. KAPLAN: Object to the form. 01:59:55	25 added, "playing back multimedia content in 02:02:55
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42 (Pages 162 - 165)

<p>1 synchrony."</p> <p>2 And then they removed "initiating playback"</p> <p>3 in two locations.</p> <p>4 Q Okay. So looking at the amendments to</p> <p>5 Claim 3, do you agree that the applicant added the 02:03:13</p> <p>6 word "particular" in front of the word "playback"</p> <p>7 throughout Claim 3?</p> <p>8 A Yes, except for one location, second to the</p> <p>9 last line.</p> <p>10 MR. KAPLAN: Object to form. 02:03:34</p> <p>11 THE WITNESS: Actually in a couple places.</p> <p>12 It's not every "playback" that has "particular."</p> <p>13 It's selective. The word "particular" was not added</p> <p>14 in front of every time "playback" appears. Only</p> <p>15 some. 02:03:53</p> <p>16 BY MR. PAK:</p> <p>17 Q Well, the word "particular" was -- all right,</p> <p>18 I see.</p> <p>19 So where it says "at least one additional</p> <p>20 playback device," you're saying it doesn't say "at 02:04:02</p> <p>21 least one additional particular playback device."</p> <p>22 Is that right?</p> <p>23 A Oh, that wasn't the only -- the second to</p> <p>24 last line of the previous page, where it says</p> <p>25 "control playback by the playback device," they did 02:04:22</p>	<p>1 amended "media playback system" to "media particular</p> <p>2 playback system"?</p> <p>3 MR. KAPLAN: Object to form. Scope.</p> <p>4 THE WITNESS: So are you asking if I had read</p> <p>5 this without the word "particular" in the amendment, 02:06:05</p> <p>6 would I still have the same opinion? Is that --</p> <p>7 BY MR. PAK:</p> <p>8 Q Yeah. So, you know, before this claim was</p> <p>9 amended, right, you know, it used the term "media</p> <p>10 playback system" instead of "media particular 02:06:19</p> <p>11 playback system," right?</p> <p>12 A Right.</p> <p>13 Q So before Claim 3 was amended to use --</p> <p>14 amended to use "media particular playback system,"</p> <p>15 would a person of ordinary skill in the art 02:06:35</p> <p>16 understand Claim 3? That's what I'm trying to ask.</p> <p>17 A Right. Probably. Although I'm kind of</p> <p>18 reforming an opinion by just quickly reading through</p> <p>19 this paragraph, but I'm just reading it as if the</p> <p>20 word "particular" isn't there, and it would just be 02:07:13</p> <p>21 "media playback," right?</p> <p>22 Q Right. So if you substituted the "particular</p> <p>23 playback system" back to "media playback system," a</p> <p>24 person of ordinary skill in the art would understand</p> <p>25 Claim 3, correct? 02:07:29</p>
<p>Page 166</p> <p>1 not add the word "particular" there.</p> <p>2 Q Is "media playback system" a broader term</p> <p>3 than "media particular playback system"?</p> <p>4 A That's --</p> <p>5 MR. KAPLAN: Object to form. 02:04:41</p> <p>6 THE WITNESS: That's the part that was</p> <p>7 difficult to ascertain. So that is one way to</p> <p>8 interpret that, that it plays back only particular</p> <p>9 media.</p> <p>10 The other one is that there's all kinds of 02:04:56</p> <p>11 playback systems, and I provided an example. It</p> <p>12 plays -- records and plays back other kind of data</p> <p>13 that is not media. And this would be particular to</p> <p>14 media.</p> <p>15 So it can be particular to all kinds of 02:05:08</p> <p>16 media, particular to one media, or a typographical</p> <p>17 error, as was indicated by Sonos. I couldn't tell</p> <p>18 which of those three -- and there may be others.</p> <p>19 And that was the reason for my opinion.</p> <p>20 BY MR. PAK: 02:05:26</p> <p>21 Q Sure. So before Claim 3 was amended in this</p> <p>22 office action response, do you think Claim 3 was</p> <p>23 indefinite?</p> <p>24 So, you know, let me ask it this way. Do you</p> <p>25 think Claim 3 was indefinite before the applicant 02:05:42</p>	<p>Page 168</p> <p>1 A Well, but they didn't have "media playback</p> <p>2 system" in Claim 3. It's not like they substituted.</p> <p>3 They just added the word "particular" in front of</p> <p>4 "playback," right?</p> <p>5 Am I reading that correctly? 02:07:46</p> <p>6 Q Yeah. Well, it says "a media particular</p> <p>7 playback system," right, currently, as amended?</p> <p>8 Do you see that?</p> <p>9 How about you read the first four lines of</p> <p>10 the claim before you get to the "wherein" clause. 02:08:21</p> <p>11 A Wait, I'm sorry, am I looking at the same</p> <p>12 paragraph?</p> <p>13 Q Yes, it's --</p> <p>14 A This is the bottom of page 3 in the document,</p> <p>15 that paragraph, right? 02:08:35</p> <p>16 Q Right. So let me read -- let me read Claim 3</p> <p>17 as amended.</p> <p>18 A Okay.</p> <p>19 Q It says:</p> <p>20 "The method of Claim 1 wherein 02:08:40</p> <p>21 detecting the set of inputs to</p> <p>22 transfer playback from the control</p> <p>23 device to the particular playback</p> <p>24 device comprises detecting a set of</p> <p>25 inputs to transfer playback from the 02:08:52</p>

<p>1 control device to a particular zone 2 group of a media particular playback 3 system that includes a first zone and 4 a second zone." 5 Do you see that? 02:09:01 6 A Yes. 7 Q Okay. Before that -- before that claim 8 limitation was written, right, it said "a media 9 playback system," not "a media particular playback 10 system," correct? 02:09:18 11 A Correct. 12 Q So if we changed "a media particular playback 13 system" back to "a media playback system," would a 14 person of ordinary skill in the art understand what 15 Claim 3 means? 02:09:35 16 A The problem is I was assuming your question 17 meant to remove all "particulars." But you're 18 saying just to remove the one? 19 I think I can agree that "media playback" is 20 more general than "media particular." 02:10:30 21 Q Right. So you understand this claim -- you 22 understand Claim 3 if it didn't say "media 23 particular playback system" and instead it said 24 "media playback system," correct? 25 A I would understand it better, yes. 02:11:01</p>	<p>1 of media formats and different types of media? 2 MR. KAPLAN: Objection. Asked and answered. 3 THE WITNESS: Yeah, I don't know the strategy 4 they had in amending the claim. 5 BY MR. PAK: 02:12:48 6 Q But do you agree with me that amending "media 7 playback system" to "media particular playback 8 system" would not overcome the teachings of Dua? 9 MR. KAPLAN: Object to form. 10 THE WITNESS: It depends how they conceive -- 02:13:07 11 or perceive the word "particular". If they were 12 trying to make this broader than the formats that 13 Dua was listing, then maybe that was their strategy. 14 So in their mind, they're trying to say it's 15 broader. 02:13:26 16 But, again, I don't -- I don't know why they 17 used the word "particular". 18 BY MR. PAK: 19 Q What does it mean to play a particular media 20 format? 02:13:43 21 A To play a particular media format? It means 22 the system is instructed to start playing that 23 format, that content in that format. 24 Q So does Dua disclose a system that's 25 instructed to start playing a particular media 02:14:17</p>
<p>Page 170</p> <p>1 Q Do you think the applicant amended "media 2 playback system" to "media particular playback 3 system" to overcome the cited references? 4 A I don't know how to answer that. You'd have 5 to ask the applicant. 02:11:25 6 Q Well, we talked about the Dua reference, 7 right? 8 A Yes. 9 Q And the Dua reference disclosed a media 10 player that can play particular media formats, 02:11:33 11 right? 12 A Right. 13 Q And we talked -- 14 A But there are many ways to respond to it. So 15 I don't know if that was the only reason, is what 02:11:51 16 I'm trying to say. I can't put myself in their 17 shoes. 18 Q Right. But you understand that Dua discloses 19 a media player that can play different kinds of 20 media formats and different types of media, right? 02:12:08 21 A Yes. 22 Q So why do you think the applicant amended 23 "media playback system" to be a particular system -- 24 "a media particular playback system" if Dua already 25 teaches a media player that can play different kinds 02:12:28</p>	<p>Page 172</p> <p>1 format? 2 A He does. And he lists examples of those 3 formats. 4 Q What does it mean to play a particular type 5 of media? 02:14:35 6 A Isn't that the same answer -- or the same 7 question? I'm not sure -- as opposed to the format 8 you mean? 9 Q Yeah. So, you know, there's -- you can play 10 a particular type of media format, right, and that 02:14:55 11 would be like an MP3 or 4 and the like, correct? 12 But you can also play a particular type of media, 13 which could be video or audio, text and the like, 14 correct? Do you follow? 15 A Yes. 02:15:13 16 MR. KAPLAN: Object to form. 17 BY MR. PAK: 18 Q Okay. So in that context, does Dua disclose 19 a system that can play a particular type of media? 20 A He discloses several types of media, 02:15:40 21 pictures, images, PowerPoint presentations, audio, 22 video. Yes. 23 Q So when the applicant amended "media playback 24 system" to "media particular playback system," would 25 you agree with me that amending "media playback 02:16:11 Page 173</p>

<p>1 system" to "media particular playback system" would 2 not overcome the teachings of Dua?</p> <p>3 MR. KAPLAN: Objection. Asked and answered.</p> <p>4 THE WITNESS: I mean, that's a tough call.</p> <p>5 That's why we have examiners, right? I don't know 02:16:31 6 if I can make that call.</p> <p>7 BY MR. PAK:</p> <p>8 Q Well, are there any other reasons why the 9 applicant would amend "media playback system" to 10 "media particular playback system"? 02:16:53</p> <p>11 A Other than trying to respond to the examiner 12 or -- as I said, you know, that would be one reason. 13 Or they thought they had made an error and they're 14 trying to correct it. Those are the two main 15 reasons in my head. 02:17:10</p> <p>16 Q Okay. So take a look at PDF page 15 again, 17 "Summary of the Office Action".</p> <p>18 A Yes.</p> <p>19 Q In the "Summary of the Office Action," it 20 talks about 103 rejections, correct? 02:17:34</p> <p>21 A Yes.</p> <p>22 Q Do you see any other rejections?</p> <p>23 A I'm sorry, can you remind me what the 103 24 rejection is?</p> <p>25 Q Yeah. So 103 rejection is an obviousness 02:17:48 Page 174</p>	<p>1 Q Right.</p> <p>2 A Paragraph 3?</p> <p>3 Q Yeah. And looking at Claim 3, you're not 4 entirely sure why the applicant amended "media 5 playback system" to "media particular playback 02:19:12 6 system," correct?</p> <p>7 A I'm not sure, no.</p> <p>8 Q But you do understand that Dua discloses a 9 media particular playback system, correct?</p> <p>10 A Correct. But I guess the question is, is 02:19:29 11 that the only way to respond to that rejection?</p> <p>12 Without being the applicant and knowing more, I 13 couldn't answer that.</p> <p>14 But it was a response presumably to address 15 the concern. That doesn't make it the correct 02:19:42 16 response. It's a response.</p> <p>17 Q Right. And the only other reason why an 18 applicant would amend its claims, other than 19 responding to an examiner, would be to correct an 20 informality, such as a typographical error, correct? 02:19:59</p> <p>21 MR. KAPLAN: Object to form.</p> <p>22 Mischaracterizes. Leading.</p> <p>23 Go ahead.</p> <p>24 THE WITNESS: Those are two reasons I have 25 off the top of my head. I mean, there could be 02:20:12 Page 176</p>
<p>1 type rejection.</p> <p>2 There's also 102 type rejections, which could 3 be anticipation -- anticipatory type rejections, 4 right?</p> <p>5 And then you also have 112 rejections, which 02:18:02 6 might have to do with, you know, formality of the 7 claims or, you know, maybe the patent lacks written 8 description of enablement and the like. Or it might 9 be indefinite, right?</p> <p>10 A Right. Okay. 02:18:18</p> <p>11 Q All right. So with that understanding here, 12 do you see in the Summary of the Office Action there 13 are only 103 rejections, right?</p> <p>14 A Right.</p> <p>15 Q And you don't see any 112 rejections, 02:18:28 16 correct?</p> <p>17 A Correct.</p> <p>18 Q So the -- so the applicant here was 19 responding to the examiner's 103 rejections in the 20 non-final office action of July 25, 2016, correct? 02:18:44</p> <p>21 MR. KAPLAN: Object to form.</p> <p>22 THE WITNESS: Yes. I presume that's what -- 23 the response that was written by the applicant, 24 right?</p> <p>25 BY MR. PAK: 02:18:56 Page 175</p>	<p>1 other reasons that I'm not -- I don't think those 2 are the only two reasons to list.</p> <p>3 BY MR. PAK:</p> <p>4 Q Sitting here today, can you think of any 5 other reasons why an applicant would amend its 02:20:24 6 claims other than those two reasons?</p> <p>7 A I don't know. The marketing department 8 decided that it would be important to have certain 9 words in the patent?</p> <p>10 I'm thinking -- I'm trying to think of other 02:20:41 11 reasons. There could be a lot of other reasons. It 12 depends. They become a public record, obviously, so 13 that could be another reason.</p> <p>14 Q Why do you think the applicant would amend 15 "media playback system" to "media particular 02:20:59 16 playback system" if amending "media playback system" 17 to "media particular playback system" would render 18 the claim indefinite, in your opinion?</p> <p>19 A Well, I don't think they asked me my opinion, 20 so how would they know that this would become an 02:21:22 21 issue?</p> <p>22 At the time, I'm sure it made sense to them 23 for some reason that we don't know, that I don't 24 know.</p> <p>25 Q That's fair. 02:21:31 Page 177</p>

<p>1 Now, I want to go back to the '206 patent 2 now. It's Exhibit 10. And I want to take a look at 3 column 8.</p> <p>4 A Okay.</p> <p>5 Q Okay. And you don't have to read this out 02:22:11 6 loud, but could you please review lines 7 7 through 36.</p> <p>8 A 7 through 36?</p> <p>9 Q Yeah. And then we can discuss.</p> <p>10 And just let us know when you're finished. 02:22:35</p> <p>11 A Okay.</p> <p>12 Q Okay. Does the '206 patent disclose two 13 mechanisms for grouping zone players?</p> <p>14 MR. KAPLAN: Object to the form.</p> <p>15 THE WITNESS: I'm trying to see where it 02:23:34 16 says another mechanism. I see what it says, but it 17 starts -- the line starts with "One mechanism for 18 joining zone players."</p> <p>19 BY MR. PAK:</p> <p>20 Q Sure. And what is that one mechanism? 02:23:46</p> <p>21 A It says: 22 "To link a number of zone players 23 together to form a group."</p> <p>24 Q And what does the '206 patent say that one 25 mechanism entails to link a number of zone players 02:24:07</p>	<p>1 Q What are the example zones disclosed in 2 column 8?</p> <p>3 A Bathroom, bedroom, den, dining room, family 4 room and foyer.</p> <p>5 Q Okay. And looking at column 8, line 29, 02:25:45 6 could you please read that -- read the first three 7 sentences.</p> <p>8 A Okay.</p> <p>9 "For instance, a Morning zone 10 scene/configuration command would link 02:26:09 11 the bedroom, den and dining room 12 together in one action. Without this 13 single command, the user would need to 14 manually and individually link each 15 zone. Figure 3A provides an 02:26:21 16 illustration of one zone scene where 17 the left column shows the starting 18 zone grouping. All zones are 19 separate. The column on the right 20 shows the effects of grouping the 02:26:35 21 zones to make a group of three zones 22 named after Morning."</p> <p>23 Q Okay. So I want to take a look at Figure 3A 24 now. It's on PDF page 8.</p> <p>25 A Yes. 02:27:06</p>
<p>1 together to form a group?</p> <p>2 A So they -- one second.</p> <p>3 "The user may manually link each 4 zone player or room one after the 5 other," sequentially presumably. 02:24:24</p> <p>6 Q So that's the -- that's the one mechanism 7 disclosed in the '206 patent, right?</p> <p>8 A Yeah.</p> <p>9 MR. KAPLAN: Object to form.</p> <p>10 BY MR. PAK: 02:24:37</p> <p>11 Q Is there another mechanism for linking a 12 number of zone players together to form a group?</p> <p>13 A I guess you must be referring to line 23 14 perhaps: 15 "According to one embodiment, a 02:24:57 16 set of zones can be dynamically linked 17 together using one command."</p> <p>18 Is that the other mechanism that you're 19 referring to?</p> <p>20 Q Yes. 02:25:16</p> <p>21 A Okay.</p> <p>22 Q So the '206 patent discloses example zones, 23 correct?</p> <p>24 A Right. They have a list of what they call 25 zones and then some names, yeah. 02:25:30</p>	<p>1 Q So on the left side of the arrow, you know, I 2 see bathroom, bedroom, den, dining room, family room 3 and foyer, right?</p> <p>4 A Yes.</p> <p>5 Q What do -- what does the left side of the 02:27:17 6 arrow represent, or those rooms represent?</p> <p>7 A Based on what we just read, they call them 8 zones.</p> <p>9 Q And the right side of the arrow -- well, what 10 does -- what does the right side of the arrow 02:27:42 11 indicate in Figure 3A?</p> <p>12 MR. KAPLAN: Object to form.</p> <p>13 THE WITNESS: It's the same -- the same 14 zones, but the -- but three of them have been put in 15 a -- some kind of group. And that group is -- has 02:27:54 16 the bracket that indicates that it's called Zone 17 Configuration/Scene.</p> <p>18 BY MR. PAK:</p> <p>19 Q What are -- what are the three zones that are 20 put into some kind of group? 02:28:22</p> <p>21 A Bedroom, den and dining room.</p> <p>22 Q Do you know what the name of that -- what the 23 patent describes as -- let me start over.</p> <p>24 What does the patent call this group that 25 includes the three zones, bedroom, den and dining 02:28:49</p>

<p>1 room?</p> <p>2 A Sorry, what was that column? Was it</p> <p>3 column 8?</p> <p>4 Q Yes, column 8.</p> <p>5 A And it says "to make a group of three zones 02:29:03</p> <p>6 named after Morning." A little odd that the word</p> <p>7 "after" is there, but okay.</p> <p>8 Q Yeah, go -- look at the sentence before. You</p> <p>9 know, it says:</p> <p>10 "Figure 3A provides an 02:29:32</p> <p>11 illustration of one zone scene where</p> <p>12 the left column shows the starting</p> <p>13 zone grouping. All zones are</p> <p>14 separate. The column to the right</p> <p>15 shows the effect of grouping the zones 02:29:45</p> <p>16 to make a group of three zones named</p> <p>17 after Morning."</p> <p>18 Right?</p> <p>19 A Right.</p> <p>20 Q So looking at Figure 3A, the group of zones, 02:29:52</p> <p>21 bedroom, den and dining room, that's an illustration</p> <p>22 of a zone scene, correct?</p> <p>23 MR. KAPLAN: Object to form.</p> <p>24 THE WITNESS: So I didn't provide an opinion</p> <p>25 on what a zone scene is. To define that here kind 02:30:26</p>	<p>1 Q So with respect to Figure 3A, you know, the</p> <p>2 group of three zones named after Morning, that's</p> <p>3 referring to the Morning zone scene, correct?</p> <p>4 MR. KAPLAN: Object to form. Asked and</p> <p>5 answered. 02:31:52</p> <p>6 THE WITNESS: Well, but it has -- in line 29</p> <p>7 it says "Morning zone scene/configuration," and then</p> <p>8 in Figure 3A it says "zone configuration/scene," the</p> <p>9 other way around.</p> <p>10 So I couldn't tell from this for sure without 02:32:13</p> <p>11 looking further if that is the definition of zone</p> <p>12 scene or not. It has additional stuff.</p> <p>13 BY MR. PAK:</p> <p>14 Q Right. But your understanding of a zone</p> <p>15 scene is that it's some kind of representation of a 02:32:28</p> <p>16 grouping that has some additional attributes, right?</p> <p>17 A Yes, that's my best understanding. The</p> <p>18 attributes having to do with what throughout the</p> <p>19 specification is called some kind of themes.</p> <p>20 Q Why don't we take a look at column 10 of the 02:32:49</p> <p>21 patent.</p> <p>22 A Okay.</p> <p>23 Q And I want to look at line 21 here. It says:</p> <p>24 "Given a saved scene, a user may</p> <p>25 activate the scene at any time or set 02:33:21</p>
<p>Page 182</p> <p>1 of on the fly would be a little premature, or I'd</p> <p>2 have to look at it more.</p> <p>3 You know, reading through for the -- for the</p> <p>4 other opinions that I formed, I found that zone</p> <p>5 scene represents some kind of grouping, but it has 02:30:43</p> <p>6 something additional, some kind of theme or</p> <p>7 attributes that go beyond a simple grouping.</p> <p>8 But, again, that's not a -- that's not an</p> <p>9 official opinion yet.</p> <p>10 BY MR. PAK: 02:30:59</p> <p>11 Q Okay. So, you know, looking at column 8, you</p> <p>12 know, where we were before, and it says:</p> <p>13 "For instance, a Morning zone</p> <p>14 scene/configuration command would link</p> <p>15 the bedroom, den and dining room 02:31:14</p> <p>16 together in one action."</p> <p>17 Do you see that?</p> <p>18 A Yes.</p> <p>19 Q And then, you know, as we discussed, it says:</p> <p>20 "The column to the right shows 02:31:24</p> <p>21 the effects of grouping the zones to</p> <p>22 make a group of three zones named</p> <p>23 after Morning."</p> <p>24 Do you see that?</p> <p>25 A I see. 02:31:32</p>	<p>Page 184</p> <p>1 up a timer to activate the scene at</p> <p>2 610."</p> <p>3 Do you see that?</p> <p>4 A I see it.</p> <p>5 Q After the user activates the scene, what does 02:33:29</p> <p>6 the '206 patent say happens next?</p> <p>7 A So they say "scene" here, which is not clear</p> <p>8 if they mean zone scene in their own language.</p> <p>9 That's my first thought.</p> <p>10 But what -- you're saying what do they say 02:33:59</p> <p>11 in this sentence?</p> <p>12 Q Yeah, so let's back up here.</p> <p>13 And, you know, this is talking about with</p> <p>14 respect to Figure 6, but at the -- you know, the</p> <p>15 first paragraph of column 10, says: 02:34:14</p> <p>16 "The process 600 is initiated</p> <p>17 only when a user decides to proceed</p> <p>18 with a zone scene at 602."</p> <p>19 Do you see that?</p> <p>20 A Yes. 02:34:26</p> <p>21 Q So when it talks about a scene at step 610,</p> <p>22 it's talking about a zone scene, correct?</p> <p>23 MR. KAPLAN: Object to form.</p> <p>24 THE WITNESS: Probably, but why don't they</p> <p>25 just write it to make it clear? It's not -- most 02:34:50</p>

<p>1 likely is my answer.</p> <p>2 BY MR. PAK:</p> <p>3 Q Okay. So at 610, you know, I read this</p> <p>4 before. It says:</p> <p>5 "Given a saved scene, a user may 02:35:11</p> <p>6 activate the scene at any time or set</p> <p>7 up a timer to activate the scene at</p> <p>8 610."</p> <p>9 So what does the '206 patent say happens</p> <p>10 next? 02:35:25</p> <p>11 A After this action has happened?</p> <p>12 Q Yes.</p> <p>13 A It's the next couple of sentences, right?</p> <p>14 Q So what does that say?</p> <p>15 A So line 24: 02:35:44</p> <p>16 "At 612, upon the activation of a</p> <p>17 saved scene, the process 600 checks</p> <p>18 the status of the players associated</p> <p>19 with the scene."</p> <p>20 Q Okay. So what does -- what does the patent 02:35:56</p> <p>21 say happens at step 614?</p> <p>22 A</p> <p>23 "At 614, commands are executed</p> <p>24 with the parameters, e.g., pertaining</p> <p>25 to a playlist and volumes." 02:36:11</p>	<p>1 Q I think -- I think member -- so member here</p> <p>2 is referring to devices or nodes on the network,</p> <p>3 right?</p> <p>4 A Okay.</p> <p>5 Q So you agree with me that after a user 02:37:36</p> <p>6 activates a zone scene, data is transported from a</p> <p>7 member, for example, a controller or a player, to</p> <p>8 other members in the zone scene, right?</p> <p>9 A Yes.</p> <p>10 Q And what does that data that is transported 02:37:57</p> <p>11 from a member to another member pertain to?</p> <p>12 A Well, in the example they provide, it says it</p> <p>13 pertains to a playlist and volumes. So we have to</p> <p>14 read it the way they say it, right?</p> <p>15 Q Yeah. So let's take a look at column 10, 02:38:23</p> <p>16 lines 12 through 20. It starts with "In the example</p> <p>17 of Figure 1."</p> <p>18 Do you see that?</p> <p>19 A Yes.</p> <p>20 Q Could you please read the first two 02:38:35</p> <p>21 sentences.</p> <p>22 A</p> <p>23 "In the example of Figure 1, the</p> <p>24 scene is saved in one of the zone</p> <p>25 players and displayed on controller 02:38:43</p>
<p>1 Q And what is the next --</p> <p>2 A Yeah, go ahead?</p> <p>3 Q Can you keep reading the next two sentences.</p> <p>4 A Yes.</p> <p>5 "In one embodiment, data, 02:36:23</p> <p>6 including the parameters, is</p> <p>7 transported from a member, e.g., a</p> <p>8 controller, to other members in the</p> <p>9 scene so that the players are caused</p> <p>10 to synchronize an operation configured 02:36:34</p> <p>11 in the scene. The operation may cause</p> <p>12 all players to play back a song in</p> <p>13 identical or different volumes or to</p> <p>14 play back a pre-stored file."</p> <p>15 Q So after a user activates a zone scene, data 02:36:51</p> <p>16 is transported from a member to another member in</p> <p>17 the zone scene, right?</p> <p>18 MR. KAPLAN: Object to form.</p> <p>19 THE WITNESS: So what is a member here?</p> <p>20 BY MR. PAK:</p> <p>21 Q So a member here -- you know, you just read</p> <p>22 it here. It says "transferred from a member, for</p> <p>23 example, a controller."</p> <p>24 A member can also be a player, right?</p> <p>25 A Okay. 02:37:24</p>	<p>1 142. In operation, a set of data</p> <p>2 pertaining to the scene includes a</p> <p>3 plurality of parameters. In one</p> <p>4 embodiment, the parameters include,</p> <p>5 but may not be limited to, 02:38:56</p> <p>6 identifiers, e.g., IP address, of the</p> <p>7 associated players and a playlist.</p> <p>8 The parameter may also include</p> <p>9 volume/tone settings for the</p> <p>10 associated players in the scene." 02:39:08</p> <p>11 Q Okay. So returning to my question, after a</p> <p>12 user activated a zone scene, there is some data that</p> <p>13 is transported from a member to another member in</p> <p>14 the scene, right?</p> <p>15 MR. KAPLAN: Object to form. 02:39:27</p> <p>16 THE WITNESS: That's what this paragraph</p> <p>17 seems to describe, yes.</p> <p>18 BY MR. PAK:</p> <p>19 Q Right. And that data that's transported from</p> <p>20 a member to another member is data pertaining to a 02:39:36</p> <p>21 zone scene, correct?</p> <p>22 MR. KAPLAN: Object to form.</p> <p>23 THE WITNESS: Well, it's data -- it's a set</p> <p>24 of parameters that they want to apply to that zone</p> <p>25 scene they're sending. 02:39:58</p>

<p>1 BY MR. PAK:</p> <p>2 Q Right. So let me ask you this way.</p> <p>3 So when a scene is saved in one of the zone 4 players and displayed on a controller, right, there 5 is some form of data pertaining to that zone scene 02:40:12</p> <p>6 that gets saved in the zone player, right?</p> <p>7 MR. KAPLAN: Object to form.</p> <p>8 THE WITNESS: This is not the data that we're 9 talking about here that's being sent to it. I'm not 10 surc I understand. 02:40:37</p> <p>11 There's a scene that's been created. And 12 this to me says that from -- the user can decide 13 from the controller to select that scene -- and I'm 14 paraphrasing -- and send these parameters that we 15 talked about to the zone players in that scene. 02:40:53</p> <p>16 BY MR. PAK:</p> <p>17 QOkay. So let's look -- let's relook at 18 column 10, lines 12 to 15. It says:</p> <p>19 "In the example of Figure 1, the 20 scene is saved in one of the zone 02:41:08</p> <p>21 players and displayed on controller 22 142. In operation, a set of data 23 pertaining to the scene includes a 24 plurality of parameters."</p> <p>25 Do you see that? 02:41:18</p>	<p>1 repeat that.</p> <p>2 So when you save a song on a computing 3 device, you're saving a file that represents a song 4 in the computing device, correct?</p> <p>5 A No, I don't agree with that. 02:43:17</p> <p>6 What is a song? That's an abstract -- the 7 song is the file. So it's not a representation.</p> <p>8 It's the song. That is the file that you're saving.</p> <p>9 Q So when someone says -- so when a user 10 decides to save a song, what happens under the hood, 02:43:40</p> <p>11 like, how does the computing device save a song?</p> <p>12 A The song --</p> <p>13 MR. KAPLAN: Object to the form.</p> <p>14 THE WITNESS: Assuming the song is in digital 15 form, the computing device saves the song file which 02:44:02</p> <p>16 contains a sequence of bits that, when played back, 17 are the song.</p> <p>18 BY MR. PAK:</p> <p>19 Q Yeah, so let me ask you it this way then.</p> <p>20 When a user tries to save a song from a 02:44:27</p> <p>21 computer from an Ethernet interface, right, if --</p> <p>22 the user inputs a command to save the song, right?</p> <p>23 A Yes.</p> <p>24 Q And the computing device receives that 25 command to save a song, correct? 02:44:57</p>
<p>1 A Yes.</p> <p>2 Q Now, when you save a zone scene in one of the 3 zone players, you're really saving data pertaining 4 to the zone scene in one of the zone players, 5 correct? 02:41:29</p> <p>6 MR. KAPLAN: Object to form.</p> <p>7 THE WITNESS: I don't know. I don't know 8 what they're saving.</p> <p>9 BY MR. PAK:</p> <p>10 Q Well, the zone player has to save some form 02:41:44</p> <p>11 of data that represents the zone scene, right, if 12 it's going to save a zone scene?</p> <p>13 MR. KAPLAN: Object to form.</p> <p>14 THE WITNESS: I guess what I'm trying to 15 figure out there is, isn't the zone scene the data 02:42:07</p> <p>16 itself?</p> <p>17 BY MR. PAK:</p> <p>18 Q Well, let me ask -- let me ask you this way.</p> <p>19 When you want to save a song on your 20 computer, some form of data is saved on that 02:42:27</p> <p>21 computer, right, that represents the song?</p> <p>22 A Well, it's the audio file that is the song.</p> <p>23 Q Right. So when you -- when you save a song 24 on a computer, you're saving a -- you're saving a 25 file that represents a song and -- let me just 02:42:49</p>	<p>1 A Yes.</p> <p>2 Q How does the computing device or, you know -- 3 starting over here.</p> <p>4 What action does the computing device do to 5 actually save a song in the computing device? 02:45:14</p> <p>6 MR. KAPLAN: Object to form.</p> <p>7 THE WITNESS: Assuming the saving location 8 has -- the saving location has been determined, 9 which is the intermediate step, the computing device 10 will start at the first bit and start writing it to 02:45:31</p> <p>11 that location until it's finished. In memory or on 12 the hard drive somewhere.</p> <p>13 BY MR. PAK:</p> <p>14 Q So the computing device saves a song in the 15 hard drive or memory, you know, in the form of a 02:45:57</p> <p>16 file, right?</p> <p>17 A I don't know -- the song is a file. It 18 sounds like you're saying the song is something else 19 and then it gets converted to a file, and that's 20 just not the case. 02:46:17</p> <p>21 The song is the file. Without that, there's 22 no song.</p> <p>23 Q Well, let me ask you this way.</p> <p>24 From a user perspective, right, a user would 25 say that he or she plays a song, right? He or she 02:46:59</p>

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<p>1 wouldn't say that he or she plays a file, right, or 2 plays data?</p> <p>3 A Well, that's the vernacular as opposed to the 4 actual technical. I could point you to a number of 5 users in my department that would say they're 02:47:27 6 playing a data file.</p> <p>7 So, I mean, I don't think that's -- I mean, 8 maybe a user would say that, but it doesn't make it 9 technically correct.</p> <p>10 Q All right. Let's talk about this in the 02:47:49 11 context of Microsoft Word then.</p> <p>12 When you save a Microsoft Word document, 13 right, what format does your computing device save a 14 Microsoft Word document?</p> <p>15 A It is again a sequence of bits that -- the 02:48:13 16 format is not open to us. It's a Microsoft internal 17 format. So I couldn't tell you what the file looks 18 like. You can only reopen it by using their user 19 interface.</p> <p>20 Q When you save a Microsoft Word document, 02:48:39 21 you're saving some form of data, right?</p> <p>22 A I mean, that's -- everything on your computer 23 is data, so yes.</p> <p>24 Q And that data that is saved represents the 25 Microsoft Word document, right? 02:49:12</p>	<p>1 Q Okay. And during the break I uploaded the 2 '033 patent and marked it as Exhibit 14.</p> <p>3 (Exhibit 14 was marked for identification 4 electronically and is attached hereto.)</p> <p>5 BY MR. PAK: 03:03:09</p> <p>6 Q Do you see that?</p> <p>7 A Just checking here.</p> <p>8 Yes.</p> <p>9 Q And you looked at the '033 patent, correct?</p> <p>10 A Yes, I did. 03:03:26</p> <p>11 Q I want to take a look at Claim 1 on PDF 12 page 28.</p> <p>13 Could you please read the transmitting an 14 instruction limitation that you mentioned in 15 paragraph 74 of your declaration. 03:03:50</p> <p>16 A I'm still scrolling.</p> <p>17 Q It's the second to the last page.</p> <p>18 A Yes. You want me to read the part that has 19 the transmitting the instruction?</p> <p>20 Q Yeah. How about -- how about you read the 03:04:13 21 transmitting an instruction limitation, you know, 22 all the way -- all the way before the "wherein" 23 clause.</p> <p>24 A Okay. So line 53?</p> <p>25 Q Yeah, correct.</p>
<p>1 A I think it's the same thing. As I said 2 before, it doesn't represent it, it is the Microsoft 3 Word document. It's not like you have another 4 representation. It's the -- it's the only one, and 5 it is the document. 02:49:30</p> <p>6 MR. PAK: Why don't we take a break now. I 7 think we've been going on for a while. I don't have 8 a whole lot left here. I know it's Friday. I don't 9 want to keep you here too long.</p> <p>10 THE VIDEOGRAPHER: Off the record at 02:50:06 11 2:50 p.m.</p> <p>12 (Recess.)</p> <p>13 THE VIDEOGRAPHER: We are on record at 14 3:02 p.m.</p> <p>15 BY MR. PAK: 03:02:27</p> <p>16 Q I want to take a look at paragraph 74 of your 17 declaration.</p> <p>18 A Yes.</p> <p>19 Q Would you please read the first sentence.</p> <p>20 A 03:02:48</p> <p>21 "Claims 1 and 12 of the '033 22 patent recite transmitting an 23 instruction, and Claims 2 and 3 recite 24 wherein the instruction comprises an 25 instruction." 03:02:56</p>	<p>1 A 2 "Based on receiving the user 3 input, transmitting an instruction for 4 at least one given playback device to 5 take over responsibility for playback 6 of the remote playback queue from the 7 computing device." 03:04:35</p> <p>8 Q Okay. Let's take a look at Claim 2, 9 column 18. Could you please read Claim 2.</p> <p>10 A 03:04:47</p> <p>11 "The computing device of Claim 1 12 wherein the instruction comprises an 13 instruction for the cloud-based 14 computing system associated with the 15 media" -- 03:04:58</p> <p>16 Sorry. Let me start over.</p> <p>17 "The computing device of Claim 1, 18 wherein the instruction comprises an 19 instruction for the cloud-based 20 computing system associated with the 21 media service to provide the data 22 identifying the next one or more" -- 23 "the next one or more media items to 24 the given playback device for use in 25 retrieving at least one media item 03:05:22</p>

1 from the cloud-based computing system 2 associated with the cloud-based media 3 service." 4 Q That's a pretty long claim, right? 5 So the instruction recited in Claim 2 is 03:05:38 6 referring to the instruction for at least one given 7 playback device to take over responsibility for 8 playback of the remote playback queue from the 9 computing device recited in Claim 1, correct? 10 A Yes. 03:06:14 11 Q In other words, the instruction recited in 12 Claim 2 is not referring to the program instructions 13 stored on the non-transitory computer readable media 14 as recited in Claim 1, correct? 15 MR. KAPLAN: Object to form. 03:06:43 16 THE WITNESS: I guess it's not clear what is 17 the difference between the program instructions. 18 Aren't they all instructions? I'm trying to 19 understand the reference here. 20 BY MR. PAK: 03:07:12 21 Q Does the instruction recited in Claim 2 refer 22 to an instruction for the at least one given 23 playback device to take responsibility for playback 24 on the remote playback queue from the computing 25 device in Claim 1, or does it refer to the program 03:07:35	1 So in that sentence, you understand that 2 wherein -- the term "wherein the instruction" 3 recited in Claim 2 refers to transmitting an 4 instruction term in Claim 1, right? 5 A Yes. I agree with that. 03:09:31 6 Q Okay. So the instruction recited in Claim 2 7 is not referring to program instructions recited in 8 Claim 1, correct? 9 MR. KAPLAN: Object to form. 10 THE WITNESS: I guess that's what I was 03:09:45 11 trying to say before. It's referring to the -- to 12 the instruction that we read in that clause of the 13 claim. But it's still a program instruction. 14 That's all I was trying to say. 15 MR. PAK: Okay. I have no further questions. 03:10:02 16 I appreciate your time, Dr. K. 17 Thanks for your time as well, Marc. 18 MR. KAPLAN: Sure. I'm just thinking for a 19 moment. 20 We'll reserve signature. And no questions 03:10:18 21 for me. 22 THE VIDEOGRAPHER: We are off the record at 23 3:10 p.m. This concludes today's testimony given by 24 Dr. Chris Kyriakakis. Total media used was five and 25 will be retained by Veritext Legal Solutions. 03:10:38
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1 instructions recited in Claim 1? 2 A Well, that's the thing. They're all program 3 instructions, right? So this instruction, 4 whichever -- whatever it's referring to, is a 5 program instruction, right? So I don't see the 03:07:56 6 difference necessarily. 7 Q Well, Claim 1 recites an instruction for 8 the at least one given playback device to take over 9 responsibility for playback of the remote playback 10 queue from the computing device, right? 03:08:16 11 A Right. But at the beginning of Claim 2 is 12 program instructions, when executed by at least one 13 processor, cause the computing device to perform 14 functions comprising -- and then a whole bunch of 15 functions -- and then this instruction clause. So 03:08:35 16 it's -- 17 Q Well, let's look at paragraph 74 again in 18 your declaration. 19 A Yes. 20 Q And you say that "Claim 1" -- I'm sorry: 03:08:49 21 "Claims 1 and 12 of the '033 22 patent recite transmitting an 23 instruction, and Claims 2 and 13 24 recite wherein the instruction 25 comprises an instruction." 03:09:04	1 2 I, CHRISTOS KYRIAKAKIS, do hereby declare 3 under penalty of perjury that I have read the 4 foregoing transcript; that I have made any 5 corrections as appear noted, in ink, initialed by 6 me, or attached hereto; that my testimony as 7 contained herein, as corrected, is true and correct. 8 EXECUTED this _____ day of _____, 9 20____, at _____, _____ (City) (State) 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 CHRISTOS KYRIAKAKIS _____ 14 15 16 17 18 19 20 21 22 23 24 25 Page 199
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1 2 3 I, the undersigned, a Certified Shorthand 4 Reporter of the State of California, do hereby 5 certify: 6 That the foregoing proceedings were taken 7 before me at the time and place herein set forth; 8 that any witnesses in the foregoing proceedings, 9 prior to testifying, were placed under oath; that a 10 record of the proceedings was made by me using 11 machine shorthand which was thereafter transcribed 12 under my direction; further, that the foregoing is 13 an accurate transcription thereof. 14 I further certify that I am neither 15 financially interested in the action nor a relative 16 or employee of any attorney of any of the parties. 17 IN WITNESS WHEREOF, I have this date 18 subscribed my name. 19 20 Dated: June 14, 2021 21 22 23  24 KATHLEEN E. BAKNEY 25 CSR No. 5698	
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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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